
AER Treatment of UED Energy Sales Volume Forecasts

*A report prepared
for United Energy Distribution*

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Executive Summary

INTRODUCTION

1. United Energy Distribution (UED) submitted an initial proposal to the Australian Energy Regulator (AER) in November 2009 supporting an increase in regulated electricity distribution network prices for the period 2011 through 2015.
2. UED's initial proposal states that a factor contributing to price increases is that total energy sales volume is forecast to decline at an average rate of 1% per year throughout the period. UED's initial proposal also states that the decline in energy sales volumes would occur despite increases in maximum demand and increases in population within UED's service area.
3. The forecast decline in energy sales volume is attributed by UED to the impact of a suite of energy efficiency policy measures that have been implemented by the Australian and Victorian Governments.
4. The AER Draft Decision made two types of adjustments to UED's initial forecast of energy sales volumes. The first was an adjustment to accommodate the AER's view of population growth in UED's service area. The second was an adjustment to accommodate the AER's view of the impact of the suite of energy efficiency policies implemented by the Australian and Victorian Governments.
5. UED has requested Marsden Jacob Associates (MJA) to provide an independent assessment of the adjustments made by the AER to UED's initial energy sales volume forecasts. MJA has also been requested to provide independent commentary on the intended effects of this suite of energy efficiency policies, on the likelihood that the intended effects would occur, and whether the intended effects could materially impact on UED's business activities.

AER TREATMENT OF UED POPULATION FORECASTS

6. The AER's Draft Decision on UED's energy sales volume forecast included a substantial adjustment attributed to a re-estimate of population growth (which impacts on both customer connections and energy sales volume).
7. The AER based its assessment of population forecasts on the results of a review undertaken by ACIL Tasman (ACIL) of NIEIR modelling that was used as a major input to UED's proposals.
8. MJA has undertaken a review of the approach adopted by the AER in assessing the impact of population forecasts on energy sales volume in UED's proposal. The principal criterion applied in assessing the AER's approach is that such forecasts should represent the best estimate, given the information available, derived by employing a methodology that does not tend to overstate or understate the impact of population growth.
9. It is MJA's view that the approach actually used by ACIL to develop its 'approximate impact' estimate, and accepted by the AER as 'best available to it', does not meet the criteria outlined above and clearly leads to a biased outcome. MJA has, therefore, concluded that there is limited utility in adopting ACIL's approach.
10. In forming the above view, MJA noted the following specific aspects of ACIL's approach that it considers to be shortcomings or errors.

- ACIL's use of historical per capita energy consumption data and the assumption that population increases will occur uniformly across Victoria will clearly lead to an overestimate of energy sales volumes for United Energy;
 - ignoring the impact of observed changes in temperature on energy consumption is likely to consistently overestimate rather than underestimate energy sales volumes because increased electricity consumption for cooling in summer is likely to be more than offset by reduced electricity consumption for heating in winter;
 - excluding consideration of changes in economic growth rates, and factors impacting energy use in the economy, will yield a far less robust estimate of energy sales volumes than is possible with 'holistic' modelling such as that used by NIEIR; and
 - ACIL has made a significant error (by using ABS Series A projections, rather than Series B) and has failed to adjust population growth by the difference between NIEIR's and ACIL's estimates of growth rates, both of which amplify the overestimation of energy sales volumes resulting from the first two of the errors and omissions noted above.
11. Given the clear bias for overestimation in the approach adopted by ACIL, MJA does not consider ACIL's 'approximate impact' estimate to be the 'best available to the AER' for assessing the impact of changes in population and customer connection on energy sales volume forecasts.
12. It is MJA's firm view that the ACIL estimate should not be used for energy forecasting purposes in preference to NIEIR's estimates; and that the 'best method available to the AER' is to revise population projections using NIEIR's energy forecasting model and the ABS Series B data.

AER TREATMENT OF UED ENERGY EFFICIENCY POLICY IMPACTS

13. UED's proposal concluded that the observed drop in annual energy sales volume growth rates (compared to rates adopted by both UED and the ESC in the 2006-10 review) demonstrated the success of various Government energy efficiency initiatives. UED also stated in its initial proposal that this decline was expected to continue into the 2011-15 period given:
- the effects of climate change (that is stimulating) government policies aimed at increasing energy efficiency and reducing usage;
 - continued development of micro generation in response to government incentives to install solar panels;
 - decline in public lighting (energy) usage as the volume of energy efficient lighting continues to increase; and
 - the introduction of AMI meters, which enable customers to monitor and control energy consumption.
14. MJA also notes that the trend observed by UED in the 2006-10 period would be likely to increase in the 2011-15 period as older, less energy efficient appliances are replaced with new, more energy efficient appliances that have been introduced in response to energy efficiency policies. This impact would also be expected to compound as new and higher standards for more energy efficient building are applied to renovations and extensions, as well as to all forms of new dwellings.

15. The forecasts of energy sales volumes for the 2011-15 period included in UED's proposal were based on forecasts prepared using NIEIR's 'holistic' economic forecasting models. NIEIR forecasts included estimates of the impact of a range of energy efficiency policies implemented by the Australian and Victorian Governments.
16. The AER considered each of the issues related to the impact of Government energy efficiency policies raised by UED (and other distributors) in its Draft Decision, taking into account advice provided by ACIL. The AER also amended UED's demand and energy forecasts to remove assumed policy impacts for standby power, insulation subsidy and time of use (TOU) tariffs.
17. The effect of the AER's draft decision on UED's forecasts is indicated in Figure 1 and Figure 2 (in the body of the report). While the wording in the AER's Draft Decision suggests that the AER accepted that some of the energy efficiency policies could impact on energy sales volumes in the 2011-15 period, the data presented in Figure 1 and Figure 2 shows that, if accepted without change, the AER's draft Decision would, in effect, require UED to ignore the potential impact of these policy initiatives in its business planning processes. Such an outcome would transfer to UED (and other distributors) the overwhelming majority of the business risk associated with outcomes from these energy efficiency policies.
18. MJA has undertaken a brief review of documents supporting the suite of policies implemented by the Australian and Victorian Government over the last decade that are intended to improve energy efficiency in the Australian economy. The brief summary of those documents presented in this report demonstrates that all Australian Governments have taken an increasingly keen interest in energy efficiency policy over the last decade, and that this interest has been consolidated into a coherent program endorsed by COAG that is intended to continue into the foreseeable future with existing energy efficiency policies almost certain to be made more demanding over time.
19. In addition, both the Australian and Victorian Governments have implemented parallel 'complementary' policies. Some of these 'complementary' policies have been ad hoc (such as the Australian Government's ill-fated Home Insulation Program); and some of the policies are continuing (such as the Victorian Government's decision to mandate universal roll-out of Advanced Metering Infrastructure (AMI) and implementation of the Victorian Energy Efficiency Target (VEET) scheme).
20. COAG and the Victorian Government require all new 'energy efficiency' policy initiatives to be subject to 'formal' or 'full regulatory impact analysis' before the policies are implemented. Such analysis is a core requirement for preparation of regulatory impact statements (RIS), which COAG has agreed should be prepared as part of the consultation process that is to be undertaken 'to establish and maintain effective arrangements to maximise the efficiency of new and amended regulation and avoid unnecessary compliance costs and restrictions on competition'. The requirements for preparing RIS are specified in detail in the *Best Practice Regulation Handbook* maintained and published by COAG and each jurisdiction in Australia.
21. The RIS process requires quantified impacts to be assessed using established principles of cost-benefit analysis; and for the assumptions underlying the analyses – and the results - to be subject to scrutiny by 'oversight agencies' and through public consultation. The discipline and rigour that underpin the RIS process does not guarantee the absence of errors in analysis or prevent adoption of unreasonable

- assumptions or data; but it does provide assurance that decisions of Government are based on a reasonable and disciplined assessment of available evidence.
22. It is, therefore, MJA's considered view that it is reasonable for UED to take account of the impact of the current policies and to make reasonable assumptions about increasingly demanding policies that are likely to be implemented in the future. It is, in MJA's view, also reasonable for the AER to place credence in the results of analysis undertaken for each of the RIS that support the suite of energy efficiency policies implemented through the COAG and Victorian Government processes.
23. In its Draft Decision, the AER made reference to only one RIS. The 2009 RIS dealing with MEPS for incandescent lamps, compact fluorescent lamps and voltage converters that was used by ACIL as a primary source for an alternative estimate of the 'lighting MEPS' impact on energy sales volume). ACIL's report also makes a passing reference to the 2009 RIS for MEPS and Labelling for Televisions.
24. MJA has briefly reviewed the relevant RIS for each individual 'energy efficiency' policy measure to confirm it was prepared in compliance with COAG (or Victorian Government) *Best Practice Regulation Handbook*, and to ascertain whether there are reasons why information in each RIS might have been overlooked, or accorded lower value by the ACIL and the AER. MJA has also prepared a summary of energy savings estimates developed in support of the energy efficiency policy initiatives. This summary is shown in Table 2 and Table 3 (in the body of the report).
25. The figures for energy savings from each RIS have been used to develop indicative savings estimate for Victoria during the forthcoming regulatory period, pro-rated based on Victoria's share of national electricity consumption. MJA acknowledges that the method adopted to allocate energy savings to Victoria is far from perfect. MJA also acknowledges that a much better method would be to 'de-construct' the RIS estimates, or to develop an independent estimate that was 'fit for purpose'. However, the intent of developing the 'indicative' energy savings estimate for Victoria is to illustrate that Governments have explicitly intended this suite of energy efficiency policies to have a material impact on energy consumption; and to demonstrate that it is reasonable for both UED and the AER to take this into account in the respective 'business planning' processes.
26. The total indicative energy savings for the whole of Victoria for the 2010-15 period from the RIS estimates is some 13,860 GWh. Given that the measures primarily target the residential and commercial sectors, it is reasonable to assume that a majority of savings would occur in distribution connected customers' premises. This figure excludes energy savings that could be attributed to:
- the (ill-fated) Home Insulation Program, which may impact on electricity sales volumes in Victoria in the order of 2,300 GWh over the 5 year period;
 - solar PV installations post 2010, which may reduce energy consumption by around 143 GWh over the 5 year period (NIEIR's estimate);
 - AMI roll-out, which is likely to directly reduce energy consumption 'modestly'; and
 - energy efficient public lighting, which could reduce energy consumption by up to 240 GWh over the 2011-2015 period if all 79 Victorian councils decide to replace all MV80 lighting assets over a 4-year period from 2012 - 2015.
27. A reasonable interpretation of information presented to Government when deciding to pursue these policies is that the total cumulative impact of the policy measures (in

Victoria) over the 2010-15 period could be of the order of 16 TWh, which is substantially higher than the estimate initially prepared by NIEIR (of 5.7 TWh).

28. The information in this report clearly shows that the energy efficiency policies implemented by the Australian and Victoria Governments were intended to produce material reductions in electricity consumption in the 2005-10 period. The impacts of these policies are sufficiently material to account for some of the reduction in electricity sales volume growth observed by UED, and should be taken into account in UED's business plans.
29. Confirmed policy changes, and others where reviews have been confirmed by Governments, are intended to intensify those impacts in the 2011-15 period and beyond. Furthermore, despite the AER's doubts about the impacts from the AMI roll-out, that program is also intended to affect both peak demand and energy consumption during the 2011-15 period.
30. Given these conclusions, it is MJA's considered view that the AER should accept the adjustments to UED's energy sales volume forecasts by at least the amounts indicated in NIEIR's modelling.

FACTORS INFLUENCING CONSUMER RESPONSE TO ENERGY EFFICIENCY POLICIES

31. Despite the firm conclusions summarised above, MJA acknowledges that actual outcome from these policies is uncertain, which creates a risk that UED should address in its business plans.
32. Specifically, the policy measures themselves do not ensure that consumers will do what the policy makers intend – and reduce energy consumption. Consumers have a choice other than to reduce energy consumption in response to these policy initiatives. They could, for example, cause what NIEIR and ACIL refer to as 'rebound' and choose greater levels of service or comfort.
33. Alternatively, response to these policies could result in increases in energy efficiency that reduce energy sales volume more than assumed by the distributors and estimated by NIEIR (and possibly even more than intended by the policy makers).
34. MJA notes that discussion of potential consumer response in ACIL's and NIEIR's reports, and in the AER Draft Decision, focuses almost entirely on the effect that 'efficient pricing' would have on consumers. MJA agrees that network and energy tariffs should be based on rational and reasonable economic principles and 'efficient' tariff structures. However, there are other factors that could ensure consumers do respond as policy makers intend. For example:
 - It is MJA's view that re-structured retail tariffs that deliver substantial benefits to consumers who are prepared to radically alter their energy use patterns are extremely unlikely to emerge in a competitive retail market, particularly in the next regulatory period. However Victorian households and businesses are facing increasing costs in a range of services, and this provides direct incentives to take advantage of Government energy efficiency policies and reduce total consumption of electricity wherever and whenever they can.
 - A second factor that is likely to influence consumer response is an increasing environmental awareness, reinforced by the lessons learned by energy consumers from their experiences in the water sector. Consumer response in the absence of modified price signals has been very marked in the water sector where substantial and sustained reductions in total water consumption have been effected by a

combination of policy measures including public education, improvements in water use efficiency of appliances, development of new technologies and alternative supply options and appliance change-over programs.

- Information obtained from the AMI rollout will, very likely, reinforce public messages that link energy conservation to reducing climate change impacts, and consumers will respond by reducing energy consumption (an outcome made 'easier' by the increasing penetration of policy driven energy efficiency measures). Such an outcome is clearly supported by trials summarised in a June 2010 report prepared by the American Council for an Energy Efficient Economy (ACEEE). This report shows that (well-designed) AMI trials assisted electricity consumers in North America achieve average household energy savings of 12.0%.

SUMMARY OF CONCLUSIONS

35. This report considers a range of issues arising from the AER's treatment of UED's energy sales volume forecasts. A summary of the findings and conclusions from this review is presented below, which confirm that:

- the approach and methodology recommend by ACIL and adopted by the AER to review and amend population (and customer connection) forecasts in UED's service territory contains a number of shortcomings and obvious errors which confirm that the AER's conclusions and proposed amendments to UED's forecasts should be modified;
- the AER could reasonably rely on NIEIR's revised forecast to estimate population trend impacts on UED's energy sales volumes providing the ABS Series B projections and updated assessments of the Victorian economy are used as a basis for the forecasts;
- Australian and Victorian Governments have implemented a suite of policies that are explicitly intended to significantly and permanently reduce energy consumption across major sectors of the economy;
- the quantum of energy savings that this suite of policies is intended to effect is material; and the impact in Victoria is likely to be significantly greater than forecast by NIEIR to 2015;
- there is prima facie evidence to support, as reasonable, an assumption that the AMI roll-out will lead to significant changes in energy consumption, including significant reductions in consumption – provided the AMI program is supported by a well-designed consumer education and awareness program that provides consumer with information that they find helpful in achieving such outcomes;
- while the outcomes from the suite of energy efficiency policies implemented by Governments is uncertain, it is reasonable for UED to base its business planning on an assumption that these policies will materially impact on energy sales volumes;
- it is also reasonable for UED to address this uncertainty and to incorporate a reasonable estimate of the accompanying business risks into its business planning processes; and
- incorporating the results from NIEIR's modelling into UED's business planning processes is a reasonable and prudent way to quantify this uncertainty; and

should be accepted by the AER as complying with relevant obligations specified in the National Electricity Rules.

1. Introduction

1.1. Background

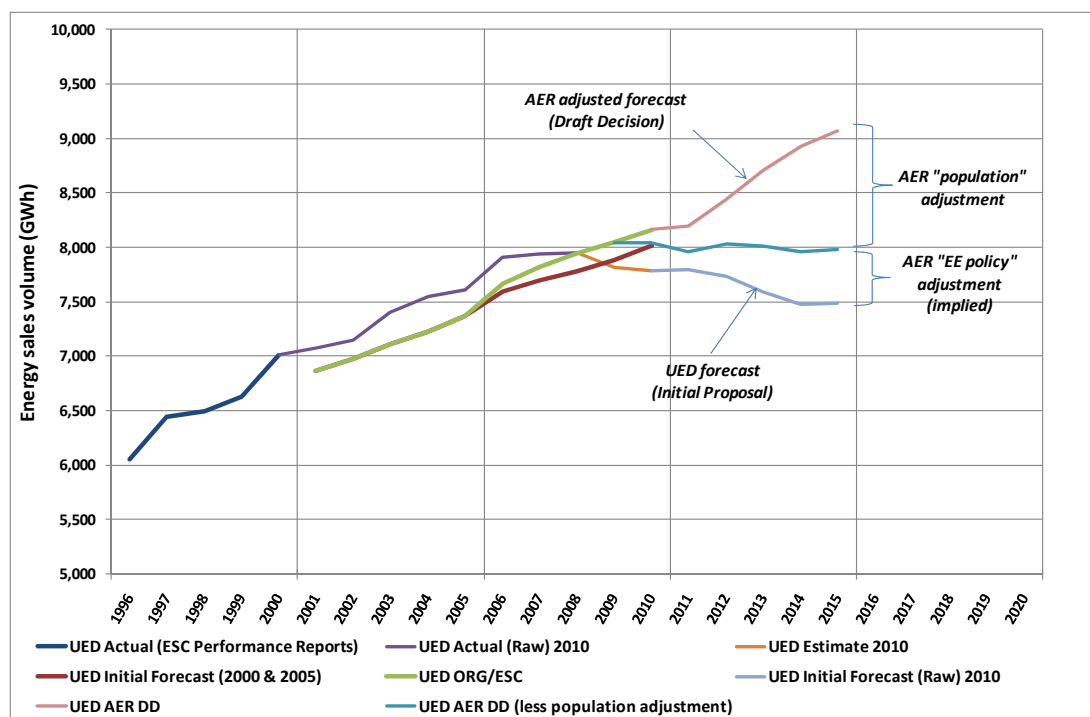
United Energy Distribution (UED) submitted an initial proposal to the Australian Energy Regulator (AER) in November 2009¹ supporting an increase in regulated electricity distribution network prices for the period 2011 through 2015.

UED's initial proposal states that a factor contributing to price increases is that total energy sales volume is forecast to decline at an average rate of 1% per year throughout the period. UED's initial proposal also states that the decline in energy sales volumes would occur despite increases in maximum demand and increases in population within UED's service area.

The forecast decline in energy sales volume is attributed by UED to the impact of a suite of energy efficiency policy measures that have been implemented by the Australian and Victorian Governments.

The energy sales volume forecast included in UED's initial proposal is illustrated in Figure 1 below. Figure 1 also shows the actual energy sales volumes reported by UED from 1996 to 2009 (plus UED's initial estimate for 2010), initial forecasts made by UED in previous regulatory reviews, forecasts finally accepted by the Office of the Regulator-General (ORG) in the 2001-05 review and the Essential Services Commission (ESC) in the 2006-10 review and the AER's Draft Decision response to UED's initial proposals for the 2011-15 period.

Figure 1: Comparison of forecast and actual energy sales volumes (United Energy)



¹ Regulatory Proposal for Distribution Prices and Services January 2011 – December 2015. United Energy Distribution, Undated (but posted on the AER Website on 30 November 2009).

Source:

- UED Actual (ESC Performance Reports) – annual Victorian Electricity Distribution Businesses Comparative Performance Report(s) published by the ESC.
- UED Actual (Raw) 2010 and UED Estimate 2010 – p.180, Table 13-1, Regulatory Proposal for Distribution Prices and Services January 2011 – December 2015, UED, November 2009.
- UED Forecast (Raw) 2010 – Table 13-5, p. 194, *Ibid*.
- UED Forecast (2000 and 2005) – forecasts proposed by UED in initial proposals submitted to the ORG and ESC.
- UED OER/ESC/AER – forecasts accepted by ORG in 2001-05 Final Determination, ESC in 2006-10 Final Determination and proposed by AER in 2011-2016 Draft Decision.
- UED AER (less population adjustment) – Table 5.15, p. 108, AER Draft Decision, 2010.

The AER Draft Decision made two types of adjustments to UED’s initial forecast of energy sales volumes. The first was an adjustment to accommodate the AER’s view of population growth in UED’s service area. The second was an adjustment to accommodate the AER’s view of the impact of the suite of energy efficiency policies implemented by the Australian and Victorian Governments.

However, the AER’s conclusions on energy sales volumes cannot be reconciled with UED’s initial forecast using information contained in the AER’s Draft Decision. The magnitude of the AER “EE policy” adjustment (implied) shown on Figure 1 is the difference between UED’s initial forecast² and the AER’s adjusted forecast of total energy sales volume³ after allowing for the AER’s “population” adjustment.⁴

NIEIR prepared the energy sales volume forecasts in UED’s initial proposal. The AER Draft Decision included discussion of NIEIR’s assumptions about economic growth and expressed concern that NIEIR’s Gross State Product forecasts were both pessimistic (partly because there were prepared soon after the “global financial crisis”), and not robust (because they predicted a 5 year business cycle which the AER says is unlikely). However, the AER did not express a quantitative opinion on the effect of revised economic growth forecasts; nor did the AER make any adjustments to the UED’s forecasts in this regard. Instead, the AER requested that UED and the other the distributors submit revised economic forecasts, which include revised population growth and energy efficiency policy impacts.⁵

The AER did not present its conclusions on the impact of energy efficiency policies for individual distributors. The figures shown in the Draft Decision as “Total policy impacts – draft decision”⁶ were for all five distributors. However, the figures quoted in the Draft Decision were of a similar order to the differences shown as AER “EE policy” adjustments for UED alone in Figure 1 above.

² Table 13-5, p.194, *Regulatory Proposal for Distribution Prices and Services January 2011 – December 2015*, UED, November 2009

³ Table 5.31, p. 157, *Victorian Draft Distribution Determination—Draft Decision*, AER, June 2010.

⁴ Table 5.15, p. 108, *Ibid*.

⁵ These revised forecasts are explained in *Electricity sales and customer number forecasts for the United Energy region to 2019 (class and network tariff) - Calendar year basis, A report for United Energy Distribution*, NIEIR, June 2010. MJA understands this report has been submitted to the AER along with UED’s response to the AER Draft Decision.

⁶ Table 5.20, p. 121, *Victorian Draft Distribution Determination—Draft Decision*, AER, June 2010.

1.2. Report scope

UED has requested Marsden Jacob Associates (MJA) to provide an independent assessment of the adjustments made by the AER to UED's initial energy sales volume forecasts.

This has required MJA to review the approach and methodology adopted by the AER to review and amend UED's initial population forecasts and also to review and summarise the purpose, objectives and anticipated outcomes from the suite of energy efficiency policies that have been implemented by the Australian and Victorian Governments.

MJA has also been requested to provide independent commentary on the intended effects of this suite of energy efficiency policies, on the likelihood that the intended effects would occur, and whether the intended effects could materially impact on UED's business activities.

1.3. Marsden Jacob Associates

MJA is a leading specialist consultancy providing high quality economic, strategic and public policy advice to governments and the private sector across Australia and New Zealand. Key areas in which MJA provides advice include the impacts of climate change and environmental and natural resource management policies on the water and energy sectors.

MJA has considerable experience and technical expertise energy policy, energy markets and energy regulation with a particular focus on the impact of environmental policy and demand side issues on the electricity and gas industries and on energy users, both large and small. This experience has been applied in undertaking analysis for, and in providing advice to, government agencies and the corporate sector including advice on:

- impact of environmental policy and regulation on the energy sector;
- impact of electricity market rules and current regulatory practice on uptake of alternative energy technologies;
- impact of alternative energy technologies on energy pricing;
- impact of water markets (and water 'rationing') on energy pricing;
- development and application of energy pricing methodologies;
- energy regulatory decisions;
- energy contract pricing;
- demand side issues and potential for demand side measures to impact on energy markets and energy regulation; and
- impact of changes in energy and environmental policy on prices paid by energy users.

MJA has completed a number of assignments that deal specifically with the impact of energy efficiency policies (and demand side response generally) on energy network prices. These include the assignments listed below.

- Advice to the Australian Greenhouse Office (now Department of Climate Change and Energy Efficiency) on pricing impacts, including the impacts on network costs and prices, of the demand side response components of the Commonwealth Solar Cities Program.⁷
- Advice to Sustainability Victoria and the Victorian Department of Sustainability and Environment on network pricing impacts of expanded renewable energy incentives that would encourage wider scale deployment of distributed generation.
- Economic and financial analysis (for the Department of Sustainability and Environment) of a roll-out of energy efficient public lighting that would reduce energy consumption in the majority of public lighting assets by 60%.
- Analysis of the impacts of proposals to increase building standards to 6 Star and preparation of a preliminary draft Regulatory Impact Statement for the Department of Sustainability and Environment.

In each of the above assignments, and in others undertaken for a range of clients, MJA has sought to ensure that the client used structured and theoretically sound methods and tools, and applied reasonable assumptions, to identify and deal with uncertainty and risk in its business planning processes or in policy development. The use of such approaches allows clients to develop quantified assessments of the risks that uncertainty creates, and to incorporate these assessments into prudent business plans or policies.

MJA applied its experience in preparing *Climate Change Impacts & Risk Management - A Guide for Business and Government*⁸ for the Australian Greenhouse Office. This document is a guide to integrating climate change impacts into risk management and other strategic planning activities in Australian public and private sector organisations. The guide was developed for the Australian Government to assist Australian businesses and organisations adapt to climate change.

The issues dealt with by MJA in this report require consideration of a number of attributes pertaining to uncertainty and risk in that:

- Governments have identified climate change and its impacts as major causes for social, environmental and economic concern.
- Governments have accepted, and taken on, a key role in mitigating these impacts by introducing policies that are specifically intended to change the ways in which Australians produce and consume energy.
- many aspects of climate science, and the outcomes of the policies intended to ameliorate the impacts that the science predicts, remain uncertain.
- this uncertainty creates risks for all Australian businesses and must be addressed if businesses are to have adequate resources and opportunities to adapt and to provide

⁷ MJA was appointed as Energy Market Advisor to the Solar Cities Project Team and assigned a significantly wider scope of work than indicated here. However, the scope specifically included consideration of the impacts on energy networks of the various demand side components of Solar Cities Projects.

⁸ The Guide is consistent with the Australian and New Zealand Standard for Risk Management, AS/NZS 4360:2004, which is widely used in the public and private sectors to guide strategic, operational and other forms of risk management. The Guide describes how the routine application of the Standard can be extended to include the risks generated by climate change impacts.

(See: <http://www.climatechange.gov.au/en/what-you-can-do/community/~media/publications/local-govt/risk-management.ashx>).

the goods and services that will assist in ameliorating the uncertain impacts of climate change; and

- the only reasonable, rational and prudent way for businesses to deal with these uncertainties and risks is to incorporate consideration and treatment of the uncertainty into a quantified assessment of risk – and to take this assessment into account in prudent business planning.

1.4. Structure of this report

Section 2 of this report examines the approach and methodology employed by the AER in its review and amendment of population (and customer connection) forecasts for UED's service territory.

Section 3 of the report summarises the AER's treatment of energy efficiency policy impacts and outlines the institutional and policy framework agreed by the Council of Australian Governments (COAG) for addressing climate change. This framework includes a suite of 'energy efficiency' policies that are specifically intended to materially reduce energy consumption in major sectors of the economy. This suite of policies is significantly wider than the policies specifically identified in the AER Draft Decision. Section 3 also identifies additional policies being implemented by the Victorian Government that seek to complement the arrangements agreed by COAG, and which are also specifically intend to reduce energy consumption.

Section 4 provides a very brief summary of key findings from a recent report prepared by the American Council for an Energy Efficient Economy, and briefly summarises recent experience in the Victorian water sector where a customer education program focussed on non-price information has resulted in sustained reductions in water consumption across Victoria. The impact of the changes in consumer behaviour has now been taken into account by the ESC when setting water service prices.

Section 5 summarises MJA's findings and conclusions.

2. AER treatment of UED population forecasts

As illustrated in Figure 1 above, the AER's Draft Decision on UED's energy sales volume forecast included a substantial adjustment attributed to a re-estimate of population growth (which impacts on both customer connections and energy sales volume).

The AER based its assessment of population forecasts on the results of a review undertaken by ACIL Tasman (ACIL) of NIEIR modelling that was used as a major input to UED's proposals.⁹

MJA has considered information contained in each of these source documents.

MJA also notes that:

- ACIL's methodology was reviewed by Frontier Economics (Frontier) for Citipower;¹⁰ and
- NIEIR provided a report¹¹ to UED which explained how issues raised by the AER (and ACIL) had been dealt with in the revised forecasts that the AER requested UED to submit.

MJA understands that both of the above reports have been submitted to the AER along with UED's response to the AER Draft Decision. MJA has reviewed both the Frontier and NIEIR reports. However, MJA has not sighted all documents relevant to discussion of the issues raised by the AER. Consequently, MJA has focussed only on addressing issues arising from considering the approach employed by the AER in the Draft Decision.

ACIL's review of NIEIR's methodology included a critique of population projections used to prepare the NIEIR forecast. Specifically, ACIL questioned the basis for NIEIR's population projections and argued that the ABS Series B population forecasts were the most appropriate projections for this purpose.¹² In undertaking its review of NIEIR's approach, ACIL also prepared estimates of the 'approximate impact'¹³ of revised population projections on UED's energy sales volume forecast, whilst recognising the limitations of using a simplistic approach. The AER noted that these estimates 'were subject to several shortcomings'¹⁴ but, despite recognising these shortcomings, still concluded that the approach adopted by ACIL was the 'best available to it (i.e. the best available to the AER)'.¹⁵

In addition, the AER concluded that 'NIEIR's population forecasts are unreasonably low when compared to historical growth rates and the projected growth forecasts from Treasury and

⁹ Victorian Electricity Distribution Price Review: Review of electricity sales and customer numbers forecasts, ACIL Tasman, April 2010.

¹⁰ Review of ACIL Tasman recommendations: A report prepared for Citipower, Frontier Economics, June 2010

¹¹ Electricity sales and customer number forecasts for the United Energy region to 2019 (class and network tariff) - Calendar year basis, A report for United Energy Distribution, NIEIR, June 2010.

¹² Table 3, p.14, Victorian Electricity Distribution Price Review: Review of electricity sales and customer numbers forecasts, ACIL Tasman, April 2010.

¹³ Op Cit.

¹⁴ p.108, Victorian Draft Distribution Determination—Draft Decision, AER, June 2010.

¹⁵ Op Cit.

the ABS';¹⁶ and that population growth assumptions should 'at least match the ABS series B forecasts'.¹⁷

2.1. Critique of the AER's approach

MJA has undertaken a review of the approach adopted by the AER in assessing the impact of population forecasts on energy sales volume in UED's proposal. The principal criterion applied in assessing the AER's approach is that such forecasts should represent the best estimate, given the information available, derived by employing a methodology that does not tend to overstate or understate the impact of population growth.

In framing comments on the approach adopted by the AER, MJA concurred with ACIL's and the AER's conclusion that the most appropriate way to estimate population growth impacts was to base these impacts on the ABS Series B population estimates. However, MJA also concluded that most appropriate way to develop a 'best estimate' was to incorporate the ABS Series B data as input to NIEIR's energy forecasting model, thereby combining it with the most up to date economic data. The locational allocation capability of NIEIR's model could then be used to develop distributor-specific estimates of population and customer connection growth rates.

It is MJA's view that the approach actually used by ACIL to develop the 'approximate impact' estimate, and accepted by the AER as 'best available to it', does not meet the criteria outlined above and clearly leads to a biased outcome. The greatest weakness in ACIL's approach is that it attempts to adjust UED's forecast energy sales volume by relying almost entirely on only one factor that affects consumption. That factor is population growth. This fails to recognise that the forecasting of energy sales volume must take account of a multitude of inter-related factors that link energy consumption with economic activity. Population growth is important, but it is by no means the only factor that must be considered in developing energy sales volume forecasts.

MJA has, therefore, concluded that there is limited utility in adopting ACIL's approach.

2.2. Deficiencies in ACIL Tasman's estimates

In forming the above view, MJA noted five specific aspects of ACIL's approach that it considers to be shortcomings or errors. The first two shortcomings, as outlined below, are almost certain to lead to material bias in ACIL's estimates. Two other shortcomings may be worthy of consideration to ensure they do not engender material bias (or lead to a consistent overestimate or underestimate of energy consumption). An obvious error in ACIL's approach is the use of inappropriate data in developing the 'approximate impact' estimate, followed by the 'compounding' of population growth rates (rather than adjusting for growth rate differences) when applying the data in question.

2.2.1. Use of historical energy consumption data

Firstly, ACIL calculated energy consumption per capita based on historical energy consumption data supplied to the AER by the distributors. ACIL did this while commenting

¹⁶ p.107, *Ibid.*

¹⁷ p.108, *Ibid.*

that ‘if Victoria is becoming more energy efficient (on a per capita basis)¹⁸ then this effect is ‘obscured’ by using historical consumption data.

MJA notes that all parties accepted that energy efficiency in the economy is improving in response to Governments implementing policies with that specific objective, and that this will cause energy consumption per capita to decline.¹⁹ In particular, MJA notes that the AER has retained net reductions in consumption due to energy efficiency policy in its Draft Decision,²⁰ albeit to a lesser extent than initially proposed by the distributors. Therefore, in the absence of other factors which may offset the decline, any population based estimates of energy consumption should reflect the expectation that energy efficiency per capita will decline.

ACIL’s use of historical data does not take account of the progressive decline in energy consumption caused by recent implementation of energy efficiency policies) and, on that basis, is bound to overestimate the impact of revised population projections.

2.2.2. Use of uniform population growth

Secondly, ACIL used the estimate of each distributor’s population share in 2010 to apportion the population forecast in 2011 and subsequent years. This assumption would only be reasonable, and avoid bias, if customer numbers, energy consumption and population grow at exactly the same proportional rate in each distributor’s service area. This, however, is not the case, as is clearly indicated by the AER’s acceptance of the statements in UED’s initial proposal that UED expects to have a declining share of customers over the next regulatory period (refer to Table 1). Therefore, apportioning based on historical population share is also bound to overestimate the impact for UED.

Table 1: AER conclusion on customer numbers

| Customer Numbers | 2011 | 2012 | 2013 | 2014 | 2015 | 2011 to 2015 CAGR²¹ |
|-------------------------|-------------|-------------|-------------|-------------|-------------|---------------------------------------|
| CitiPower | 316,243 | 321,189 | 324,686 | 328,584 | 334,914 | 1.4% |
| Powercor | 715,541 | 727,610 | 739,714 | 752,719 | 766,214 | 1.7% |
| Jemena | 308,296 | 313,257 | 317,334 | 320,907 | 325,049 | 1.3% |
| SP AusNet | 634,191 | 644,900 | 654,309 | 663,159 | 672,912 | 1.5% |
| United Energy | 630,196 | 634,300 | 637,565 | 641,377 | 646,461 | 0.6% |

Source: Tables 10 through 14, pp. xxiv-xxv, Victorian electricity distribution network service providers Distribution determination 2011–2015—Draft Decision, AER, June 2010.

¹⁸ p.15, Victorian Electricity Distribution Price Review: Review of electricity sales and customer numbers forecasts, ACIL Tasman, April 2010

¹⁹ Energy consumption per capita is total consumption divided by total population. Dividing NIEIR’s projection of total Victorian consumption by population projections implied by ABS Series B data results in declining energy consumption per capita.

²⁰ p.121, Table 5.20, Victorian Draft Distribution Determination—Draft Decision, AER, June 2010.

²¹ Compound Annual Growth Rate.

MJA also notes that a related shortcoming of applying ACIL's 'approximate impact' estimate is that the ABS projections used by ACIL are based on source data from 2007/08. That is, the source data is already two years old.

2.2.3. Ignoring climate effect

Thirdly, ACIL made no allowance for the impact of future climate conditions and does not factor weather trends into its forecasts. This creates another source of error in ACIL's 'approximate impact' estimate.

MJA notes that observed increases in temperature reported by the Bureau of Metrology occur throughout the year and throughout the day.²² This is likely to result in net reductions in energy consumption, rather than increases because reductions in energy consumption over the winter period are almost certain to be greater than increases in energy consumption over the summer period.²³

2.2.4. No account of other economic factors

Fourthly, ACIL's adjustment method takes no account of the change in economic output that would be expected to accompany increased population. Economic output is clearly driven by a range of factors, not just population growth, which is one reason why economic modelling such as that undertaken by NIEIR is a very useful input into electricity demand and consumption forecasts.

2.2.5. Incorrect use of ABS Series B data

Finally, despite ACIL suggesting that it is appropriate to use the ABS Series B population estimates, MJA noted that ACIL adopted ABS Series A population projections in its estimates, a criticism that has already been made by Frontier.²⁴ As Series A projections are higher than Series B, the overestimation effect incurred by using historical energy consumption per capita and population share is amplified.

ACIL also introduced a further error by not adjusting population estimates for the difference between NIEIR's population growth rates and ABS projection growth rates. Instead of using the difference in these rates to re-estimate total population, ACIL applied a slightly higher growth rate than NIEIR (actually derived from the ABS Series A data) to NIEIR's projections, which already included a population growth rate. This has the effect of 'compounding' growth rates and leads to an even greater over-estimate of total population.²⁵

²² The Bureau of Metrology provides a wide range of climate data analysis on its Website that shows minimum, mean and maximum temperature has increased across the whole of south eastern Australia over the last few decades (see: http://www.bom.gov.au/climate/change/aus_cvac.shtml).

²³ NIEIR's modelling takes account of this impact through the use of data based on Bureau of Metrology observations that determine Heating Degree Days and Cooling Degree Days. The Bureau data show that 'temperatures have tended to rise over the past 30 years due to localised and global warming' (p. 44, NIEIR, June 2010).

²⁴ p.15, *Review of ACIL Tasman recommendations: A report prepared for Citipower, Frontier Economics*, June 2010

²⁵ NIEIR has addressed this specific issue in its report to UED (pp. 6-7, NIEIR, June 2010).

2.3. Conclusions

MJA's conclusions from this review are that:

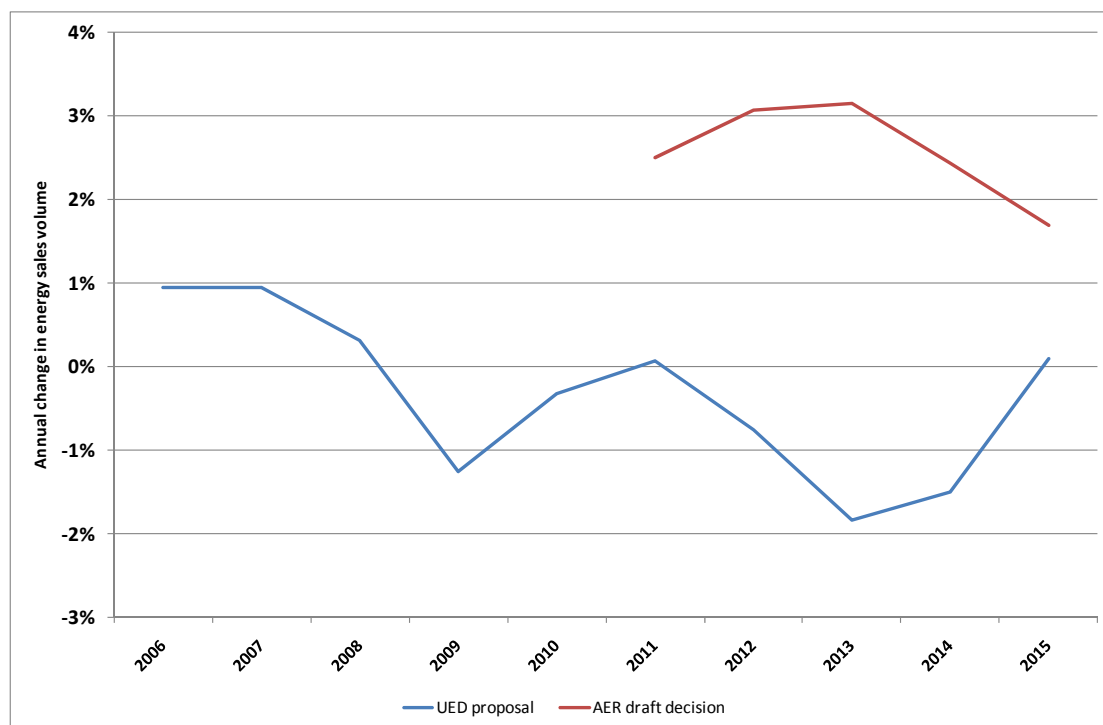
- ACIL's use of historical per capita energy consumption data and the assumption that population increases will occur uniformly across Victoria will clearly lead to an overestimate of energy sales volumes for United Energy;
- ignoring the impact of observed changes in temperature on energy consumption is likely to consistently overestimate rather than underestimate energy sales volumes because increased electricity consumption for cooling in summer is likely to be more than offset by reduced electricity consumption for heating in winter;
- excluding consideration of changes in economic growth rates, and factors impacting energy use in the economy, will yield a far less robust estimate of energy sales volumes than is possible with 'holistic' modelling such as that used by NIEIR; and
- ACIL has made a significant error (by using ABS Series A projections, rather than Series B) and has failed to adjust population growth by the difference between NIEIR's and ACIL's estimates of growth rates, both of which amplify the overestimation of energy sales volumes resulting from the first two of the errors and omissions noted above.

Given the clear bias for overestimation in the approach adopted by ACIL, MJA does not consider ACIL's '*approximate impact*' estimate to be the '*best available to the AER*' for assessing the impact of changes in population and customer connection on energy sales volume forecasts. It is MJA's firm view that the ACIL estimate should not be used for energy forecasting purposes in preference to NIEIR's estimates; and that the '*best method available to the AER*' is to revise population projections using NIEIR's energy forecasting model and the ABS Series B data.

3. AER treatment of UED energy efficiency policy impacts

As illustrated in Figure 1, actual energy sales volumes for the 2006-2009 period and the estimate for 2010 in UED’s initial proposal show that energy sales volume remained flat in the first three years of the current regulatory period and then declined slightly. The annual growth rates implied in the AER Draft Decision (which exceed 3% in 2012 and 2013) are inconsistent with growth rates observed in the 2006-2009 period. This is very clearly illustrated in Figure 2 below.

Figure 2: Comparison of annual energy sales volume growth rates



Source: UED

UED’s proposal concluded that the observed drop in annual energy sales volume growth rates (compared to rates adopted by both UED and the ESC in the 2006-10 review) demonstrated the success of various Government energy efficiency initiatives. UED also stated in its initial proposal that this decline was expected to continue into the 2011-15 period given:

- the effects of climate change (that is stimulating) government policies aimed at increasing energy efficiency and reducing usage;
- continued development of micro generation in response to government incentives to install solar panels;
- decline in public lighting (energy) usage as the volume of energy efficient lighting continues to increase; and

- the introduction of AMI meters, which enable customers to monitor and control energy consumption.²⁶

MJA also notes that the trend observed by UED in the 2006-10 period would be likely to increase in the 2011-15 period as older, less energy efficient appliances are replaced with new, more energy efficient appliances that have been introduced in response to energy efficiency policies. This impact would also be expected to compound as new and higher standards for more energy efficient building are applied to renovations and extensions, as well as to all forms of new dwellings.²⁷

As noted above, the forecasts of energy sales volumes for the 2011-15 period included in UED's proposal were based on forecasts prepared using NIEIR's 'holistic' economic forecasting models. NIEIR forecasts included estimates of the impact of a range of energy efficiency policies implemented by the Australian and Victorian Governments. UED's proposal identified (as examples) the following State and COAG initiatives to reduce emissions through lower energy sales volumes:

- the Carbon Pollution Reduction Scheme ("CPRS");
- minimum energy efficiency and performance standards for appliances (MEPS);
- 1 watt standby power in appliances;
- Australian Government Home Insulation Program;
- photovoltaic generation;
- Victorian Energy Efficiency Target (VEET); and
- residential and commercial building standards.²⁸

The AER considered each of the issues related to the impact of Government energy efficiency policies raised by UED (and other distributors) in its Draft Decision, taking into account advice provided by ACIL.²⁹

Detailed discussion of the AER's approach is beyond the scope of this report. However, in its Draft Decision, the AER stated that:

The AER also considers that the Victorian DNSPs' proposed energy consumption and customer number forecasts are not appropriate to form amounts, values or inputs to the AER's determination under clause 6.12.1(10) of the (National Electricity Rules) NER.³⁰

²⁶ p. 179, *Regulatory Proposal for Distribution Prices and Services January 2011 – December 2015*, United Energy Distribution, Undated (but posted on the AER Website on 30 November 2009).

²⁷ The 5 Star building standards were introduced into Victoria in July 2004, and applied only to new single dwellings. The 5 Star standards were extended to renovations, additions and relocations of existing dwellings in 2008. The Victorian Government has announced that 6 Star building standards will be introduced from May 2011, and will apply to all forms of dwellings, including new homes, multi-unit developments, renovations, additions and relocations.

²⁸ p. 183, *Op Cit.* NIEIR also specifically included AMI, electric vehicles, and MEPS for air conditioning in its assessment of policy impacts (see: pp 2-6, NIEIR, June 2010) as well as energy efficient public lighting (p. 44, *Ibid*).

²⁹ *Victorian Electricity Distribution Price Review - Review of electricity sales and customer numbers forecasts, Final report*, ACIL Tasman, 21 April 2010.

³⁰ p. xxiii, *Draft decision, Victorian electricity distribution network service providers Distribution determination 2011–2015*, Australian Energy Regulator, June 2010.

The AER also:

- amended the distributors' demand and energy forecasts to remove assumed policy impacts for standby power, insulation subsidy and time of use (TOU) tariffs;
- replaced the distributors' proposed population growth forecasts, which affect their energy and customer number forecasts,³¹ and
- requested the distributors to provide revised maximum demand, energy and customer number forecasts as part of their revised regulatory proposals, making the following amendments:
 - update gross state product forecast inputs to reflect more recent economic conditions;
 - replace population growth forecast inputs with ABS Series B for Victoria, disaggregated by distributor according to current proposal assumptions about each distributor's regional contribution to Victorian population growth; and
 - amend the carbon pollution reduction scheme (CPRS) policy assumption to delay the commencement of the CPRS by 6 months, to 1 January 2012.³²

The effect of the AER's draft decision on UED's forecasts is indicated in Figure 1 and Figure 2 above. While the wording in the AER's Draft Decision suggests that the AER accepted that some of the energy efficiency policies could impact on energy sales volumes in the 2011-15 period, the data presented in Figure 1 and Figure 2 shows that, if accepted without change, the AER's draft Decision would, in effect, require UED to ignore the potential impact of these policy initiatives in its business planning processes. Such an outcome would transfer to UED (and other distributors) the overwhelming majority of the business risk associated with outcomes from these energy efficiency policies.

3.1. Government energy efficiency policies

Until recently, energy efficiency policy in Australia has been fragmented and uncoordinated. For example, the Howard Government's 2004 White Paper, *Securing Australia's Energy Future*, focussed primarily on supply side issues and included only two initiatives that had an energy efficiency component:

- the provision of \$75 million for Solar Cities trials in urban areas to demonstrate a new energy scenario, bringing together the benefits of solar energy, energy efficiency and active energy markets; and
- a requirement that larger energy users undertake, and report publicly on, regular assessments to identify energy efficiency opportunities.

Despite this lack of coordination, a number of policies were developed and implemented across Australia, including those listed below.

- Mandatory Energy Efficiency Standards (MEPS)³³ for:
 - refrigerators and freezers (from 1 October 1999, revision 1 January 2005);

³¹ p. xxiv, *Op Cit*. These amendments were considered by the AER to be the minimum necessary amendments to enable the forecasts to be approved in accordance with the NER, as required by clause 6.12.3(f) of the NER.

³² *Ibid*.

³³ See: <http://www.energyrating.gov.au/meps1.html>.

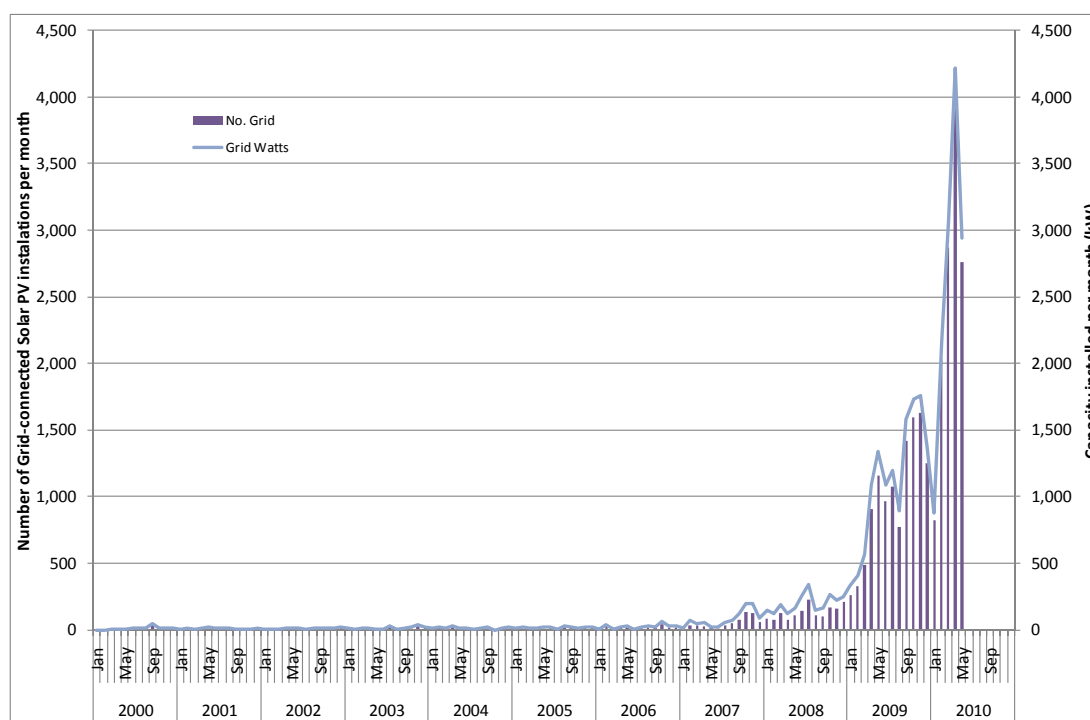
- mains pressure electric storage water heaters (from 1 October 1999);
 - three phase electric motors (0.73kW to <185kW) (from 1 October 2001, revision April 2006);
 - three phase air conditioners up to 65kW cooling capacity (from 1 October 2001, revision 1 October 2007);
 - ballasts for linear fluorescent lamps (from 1 March 2003). In addition to MEPS, ballasts are to be marked with an energy efficiency index (EEI);
 - single phase air conditioners (from 1 October 2004, revision 1 April 2006 and 2007 and 2008; further revision proposed for April 2011);
 - linear fluorescent lamps - from 550mm to 1500mm inclusive with a nominal lamp power greater than 16W (from 1 October 2004);
 - commercial refrigeration (self contained and remote systems) (from 1 October 2004);
 - distribution transformers - 11kV and 22kV with a rating from 10kA to 2.5MVA (from 1 October 2004);
 - small mains pressure electric storage water heaters (<80L) and low pressure and heat exchanger types (from 1 October 2005) ;
 - external Power Supplies and Set-top boxes (from 1 December 2008);
 - incandescent lamps and compact fluorescent lamps (from November 2009);
 - commercial building chillers and close control air conditioners (from July 2009);
 - televisions - (from 1 October 2009); and
 - transformers and electronic step-down converters for ELV lamps (proposed for October 2010).
- National standards for building energy efficiency through:
 - a landmark agreement on a comprehensive (but voluntary) strategy aimed at making Australian buildings more energy efficient (March 1999);
 - the elimination of worst energy performance practices by incorporating a single standard for minimum performance requirements into the Building Code of Australia, which were introduced in Victoria from July 2004 through a mandatory requirement for all new detached dwellings to meet the 5 Star building standards and extended to renovations, additions and relocations in May 2008; and will be further ‘upgraded’ to 6 Star standards from May 2011 and apply to all new dwellings, including multi-unit developments as well as renovations, additions and relocations.
 - Direct subsidies for small solar photovoltaic (PV) installations, administered by the Australian Government since January 2000, and amended on several occasions during that decade.³⁴ For example:
 - The Solar Homes and Communities Plan started out as the Photovoltaic Rebate Program offering \$4,000 rebates in 2000. By the time the Photovoltaic Rebate

³⁴ The Australian Government support for Solar PV was reinforced by COAG’s agreement to implement Feed-In Tariffs, although the details of the FiT arrangements differ in each jurisdiction.

Program was changed in November 2007, the program had helped to install 10,000 solar systems and was receiving an average 153 applications per week (resulting in installation rates of around 25kW per month for Victorian in 2006).

- As part of the Rudd Government's election commitments, the program was allocated \$150 million to provide increased rebates of up to \$8,000 to 15,000 homes over five years. In May 2008, a means test was placed on the solar panel rebate to ensure support was provided to the homes that most needed it.
- The number of applications for the rebate grew from 420 per week in May 2008 (107 grid-connected systems totalling 167 kW capacity for Victoria) to approximately 6,043 per week in May 2009 (1,160 grid-connected systems totalling 1.34 MW capacity for Victoria) in response to additional, market-initiated 'incentives' provided (largely) through 'bulk buying and bulk installation' programs run by system supplier/installers. 'Carryover' from these 'bulk programs' resulted in a dramatic increase in solar PV installations in Victoria, with installation rates climbing to 3,982 installations with total capacity of 4.215 MW in May 2010 (see Figure 3 below).

Figure 3: Installation of grid-connected solar PV installations in Victoria



Source: <http://www.climatechange.gov.au/what-you-need-to-know/renewable-energy/solar-homes/history.aspx>.

Note: Department of Climate Change and Energy Efficiency to no longer update this data or provide alternative data on installations under the SGU Scheme.

- The recent changes to the solar PV incentive program – which incorporated installation of 'Small Generator Units (SGU)' into the modified Renewable Energy Target (RET) scheme continue to provide favourable incentives for solar PV installation. However, the outcomes of the SGU scheme are far from certain; and this creates significant risk for UED and other distributors across Australia.

The current 5 times REC multiplier arrangements that apply to solar PV under the SGU scheme will continue until 30 June 2012. The multiplier will then decrease progressively to become a 2 times REC multiplier in June 2015. In addition, recent changes to legislation have effectively created a separate pricing mechanism for SGU RECs and, presumably, SGU REC prices will decline as the number of SGU REC eligible installations increases. It also appears reasonable to assume that the 'market appetite' for SGU installations will decline over time because (in Victoria in particular) the Feed-In Tariff arrangements that also apply to small grid-connected solar PV systems would not be expected to fully fund the initial capital outlay for a complying system – even after receiving the SGU REC credits.

However, the decline in Government incentives is likely to be offset by continuation of well-advertised 'bulk installation marketing' of solar PV (by Bunnings, other solar installation companies and some local government councils) that will maintain downward pressure on installation costs and component prices.

Even with a significant decline in the most recently reported rates of grid-connected solar PV in Victoria throughout the next regulatory period, total solar PV capacity installed in Victoria from 2000 could substantially exceed NIEIR's assumption of (approximately) 49MW³⁵ – and possibly reach more than 120MW by 2016.³⁶

In October 2008, the Council of Australian Governments (COAG) agreed to develop a National Strategy on Energy Efficiency (the Strategy)³⁷ to accelerate energy efficiency efforts, streamline roles and responsibilities across levels of governments, and help households and businesses prepare for the introduction of an emissions trading scheme. The development of the Strategy drew on consultations with stakeholders, particularly those in the building sector, in appliance and equipment manufacturing and in industry.³⁸ Additional targeted consultations also took place on specific measures, for example:

- at the Energy Efficiency Opportunities (EEO) workshops during May 2009, businesses were consulted on an enhanced EEO program and on initial design factors for some of the industrial measures contained in the Strategy; and
- proposed improvements to building energy efficiency were discussed with industry stakeholders at a forum convened by the Australian Building Codes Board (ABCB) in May 2009.

Further consultations with key stakeholders have been occurring as measures are developed, including through the formal regulatory impact analysis processes:

- the ABCB has undertaken formal consultation on proposed new energy efficiency provisions to be included in the 2010 update of the Building Code of Australia; and

³⁵ p. 6, NIEIR, June 2010 refers to a revised forecast of Solar PV installations being 'around 3 GWh than previously'. Data in Table 11 of ACIL's report shows NIEIR's earlier estimate reached 34.29 GWh in 2015 with 41,000 'panels' (actually systems) being installed in the period from 2009 through 2015. DCCEE data shows 3,087 grid-connected Solar PV systems were installed in Victoria to December 2008, with total capacity of 4.64 MW.

³⁶ Irrespective of the actual outcome, the increase in installed solar PV capacity is almost certain to create 'pockets' with significant energy export capability that would affect the quality of network performance standards.

³⁷ *National Strategy on Energy Efficiency*, COAG, July 2009.

³⁸ It is interesting to note that the description of consultations in respect of the COAG Strategy make no mention at all of consultation with energy industry participants.

- proposals to introduce or increase the stringency of MEPS for appliances and equipment, as well as proposals for mandatory energy rating labelling, are subject to full regulatory impact analysis and consultation with industry stakeholders – who have broadly signalled support for moving to a streamlined and consistently applied system of national legislation for MEPS and labelling.

Measures in the Strategy are framed around the following four key themes:

1. Assisting households and businesses to transition to a low-carbon future – by providing material assistance as well as the information and skills necessary to improve the efficiency of energy use. Complemented by the Australian Government’s Energy Efficient Homes Package, the Strategy is intended to further help households, industry and businesses reduce energy use by ensuring that they are better positioned to make well-informed decisions regarding investments in energy efficiency.
2. Reducing impediments to the uptake of energy efficiency - by providing the information designed to encourage and enable action by individuals and business (to overcome recognised market failures that inhibit uptake of energy efficiency) and ensuring that the regulatory frameworks are in place to deliver continuing improvements to:
 - electricity markets (in bringing forward demand-side initiatives);
 - the energy efficiency of appliances and equipment; and
 - the energy efficiency of the transport sector.
3. Making buildings more energy efficient – by driving significant improvement in minimum energy efficiency standards to deliver substantial growth in the number of highly energy efficient homes and commercial buildings, reflecting international best practice. The transformation is intended to be achieved through a combination of measures addressing both new building design and construction and existing building stock (and energy efficiency standards are to be reviewed (from 2012) in a clear process so that over the life of the Strategy energy efficiency requirements will be progressively increased).
4. Government working in partnership and leading the way – by improving energy efficiency of government operations, and consequently reducing the whole of life cost and environmental impact of Government activities.

Each of these Strategy themes is aligned with a number of individual measures, many of which fit under more than one theme. The processes required to establish and implement the measures are set out in the measure descriptions of the COAG Agreement. Where appropriate to measures in the Strategy, Implementation Plans were to be finalised within three months of COAG’s agreement to the Strategy (i.e. by January 2009).

In addition, both the Australian and Victorian Governments have implemented parallel ‘complementary’ policies. Some of these ‘complementary’ policies have been *ad hoc* (such as the Australian Government’s ill-fated³⁹ Home Insulation Program); and some of the

³⁹ The Home Insulation Program was a component of the Energy Efficient Homes Package, in turn an element of the Australian Government’s \$42 billion Nation Building and Jobs Plan. The Program was terminated early, on 19 February 2010, following four deaths of installers and over 100 house fires linked to the installation of insulation.

Despite its obvious flaws and faulty execution, in an initial review of the Program (following its termination), Allan Hawke stated “Any objective assessment of the HIP will conclude that, despite the safety, quality and compliance concerns, there were solid achievements against the program objectives. At the time the program

policies are continuing (such as the Victorian Government's decision to mandate universal roll-out of Advanced Metering Infrastructure (AMI) and implementation of the Victorian Energy Efficiency Target (VEET) scheme).

This brief summary demonstrates that all Australian Governments have taken an increasingly keen interest in energy efficiency policy over the last decade, and that this interest has been consolidated into a coherent program endorsed by COAG that is intended to continue into the foreseeable future with existing energy efficiency policies almost certain to be made more demanding over time.

COAG requires all new policy initiatives to be subject to 'formal' or 'full regulatory impact analysis' before the policies are implemented. Such analysis is a core requirement for preparation of regulatory impact statements (RIS), which COAG has agreed should be prepared as part of the consultation process that is to be undertaken 'to establish and maintain effective arrangements to maximise the efficiency of new and amended regulation and avoid unnecessary compliance costs and restrictions on competition'.⁴⁰ The requirements for preparing RIS are specified in detail in the *Best Practice Regulation Handbook* maintained and published by COAG and each jurisdiction in Australia.

The RIS process requires quantified impacts to be assessed using established principles of cost-benefit analysis; and for the assumptions underlying the analyses – and the results - to be subject to scrutiny by 'oversight agencies'⁴¹ and through public consultation. The discipline and rigour that underpin the RIS process does not guarantee the absence of errors in analysis or prevent adoption of unreasonable assumptions or data;⁴² but it does provide assurance that decisions of Government are based on a reasonable and disciplined assessment of available evidence.

It is, therefore, MJA's considered view that it is reasonable for UED to take account of the impact of the current policies and to make reasonable assumptions about increasingly demanding policies that are likely to be implemented in the future. It is, in MJA's view, also reasonable for the AER to place credence in the results of analysis undertaken for each of the RIS that support the suite of energy efficiency policies implemented through the COAG and Victorian Government processes.

closed on 19 February 2010, over one million homes had been insulated. Many low income households participated, with the prospect of significant savings on energy bills in years to come." (p. vii-viii, *Review of the Administration of the Home Insulation Program*, Allan Hawke, 6 April 2010).

The Senate Inquiry Report states that 1,213,155 homes were insulated before the Program was terminated (p. 18-19, *Energy Efficient Homes Package (ceiling insulation)*, The Senate Environment, Communications and the Arts References Committee, July 2010). And even though the effectiveness of the Program was questioned by the Senate Committee, DCCEE provided an updated estimate of greenhouse gas abatement for the Energy Efficiency Homes Package in March 2010 of 27 million tonnes CO_{2-e} by 2020 (from both the Home Insulation Program and the Solar Hot Water Rebate Program).

⁴⁰ See Introduction: *Best Practice Regulation Guide - a Guide for Ministerial Councils and National Standard Setting Bodies*, COAG, October 2007.

⁴¹ The 'oversight' role is undertaken in Victoria by the Victorian Competition and Efficiency Commission (VCEC). MJA's experience is that VCEC (and its counterparts in other jurisdictions) pay close attention the 'quality' of cost-benefit analysis which helps ensure that Government decision-making is appropriately informed.

⁴² Each RIS is subject to scrutiny by 'oversight agencies' and through public consultation with affected parties, However, given that individual policy measures are subject to discrete analysis, it is possible that 'double counting' of costs and benefits could occur inadvertently – even though the relevant 'oversight agencies' pay particular attention to avoiding this outcome.

3.2. Estimated impacts from energy efficiency policies

The AER Draft Decision included discussion of the impact of the suite of energy efficiency policies identified by UED (and NIEIR), and the AER based its Draft Decision largely on interpretation of the advice and recommendations provided by ACIL Tasman. In turn, ACIL's review of NIEIR modelling led to a series of conclusions about NIEIR's estimates of the impact of these policies and/or included presentation by ACIL of its own estimates.

A comparison of the NIEIR, ACIL and AER estimates is presented in Tables 5.17, 5.18 and 5.20 of the AER Draft Decision. Although, as noted in Section 1, MJA has been unable to reconcile the data contained in UED's initial proposal with that contained in the AER Draft Decision, a number of key observations can be made from the comparison:

- Table 5.17 shows that NIEIR estimated the eight energy efficiency policies and the early deployment of 'electric car' (listed by NIEIR) would reduce electricity sales volumes by 720 GWh in 2010 (for all 5 distributors), increasing to 1,434 GWh in 2015.
- Table 5.18 shows the results of ACIL's consideration of 'lighting MEPS' impact on energy sales, with NIEIR's estimate being some 139 GWh lower than ACIL's in 2010, and some 51 GWh higher in 2015.

The scope of work assigned to MJA did not allow detailed scrutiny of the AER's approach to assessing UED's estimates of energy efficiency policy impacts (because, as noted above, it is not possible to reconcile UED's initial proposal with the AER Draft Decision). However, MJA did note the following deficiencies with this particular aspect of the AER's approach:

- ACIL made its estimate of the impact of lighting MEPS using the '*projected number of households in Victoria*' – even while noting '*the Australian Government's modelling (for the Regulatory Impacts Statement) is published on only an aggregate basis, with residential, commercial and industrial impacts rolled together*' – (and that) *a direct comparison is not possible within reconstructing the RIS estimates*⁴³;
- ACIL recommended (that) '*as a minimum, the impacts of lighting MEPS be constrained to the impact estimated by the Australian Government (noting that this remains likely to overstate the impact as the modelling did not take into account the tendency to 'move ahead' of the policy)*'; and
- the AER interpreted ACIL's recommendation to mean it could 'reconstruct' from the lower of NIEIR's and ACIL's estimates for each year a time series estimate that is lower in aggregate than both, even though:
 - ACIL and NIEIR had used different assumptions and methodology to derive their respective estimates; and ACIL had made substantial compromises and simplifications to derive an estimate for Victoria from a single aggregate figure that included all Australian jurisdictions and all customer classes; and
 - NIEIR had made an assumption that 'rebound' would occur and this made it likely that NIEIR's estimate was lower than an unbiased estimate might be.

MJA can see no justification for using the number of households to estimate the impact of lighting MEPS. The lighting MEPS policy is clearly intended to impact on all lighting

⁴³ p. 112, AER Draft Decision. MJA notes that the RIS estimates also aggregate energy savings from MEPS lighting across Australia and across the period 2009 through 2020.

used by households and businesses, as ACIL acknowledged. A more reasonable basis for preparing an 'approximate estimate' for the impact of this policy measure would have been to allocate the aggregate total lighting MEPS impact (which is for Australia as a whole) by total energy consumption in each jurisdiction. Such an assumption would have, at least, implied that some account was being taken of the impact of the lighting MEPS on the industrial and commercial sectors.⁴⁴

Nor is there any clear basis for the AER accepting ACIL's recommendation over NIEIR's estimates – given the degree of simplification applied by ACIL when estimating the impact in Victoria.

Of most concern is the appearance of bias arising from the AER's interpretation of ACIL's recommendations. The appearance of bias is created because the AER has merged the lowest figure in two estimates developed using direct approaches. A more reasonable, and less biased, approach would have been to replace NIEIR's estimate with ACIL's – even though ACIL's estimate is based on less robust assumptions and methodology than NIEIR's.

- Table 5.20 shows a summary of the AER's (draft) decisions in respect of each of the energy efficiency policy measures considered by NIEIR (and ACIL). As noted above, Table 5.17 lists eight different policy measures and 'electric cars'. Table 5.20 shows that AER made adjustments to NIEIR's forecasts only in respect of 'MEPS lighting', 'Standby power' and 'insulation (the Home Insulation Program)' resulting in reduced electricity sales volumes of 582 GWh (compared to the 720 GWh estimated by NIEIR) in 2001 (for all 5 distributors), increasing to 1,059 GWh (compared to NIEIR's estimate of 1,434 GWh) in 2015.

3.3. Regulatory impact statement estimates of energy efficiency savings

In its Draft Decision, the AER made reference to only one RIS. The 2009 RIS dealing with MEPS for incandescent lamps, compact fluorescent lamps and voltage converters that was used by ACIL as a primary source for an alternative estimate of the 'lighting MEPS' impact on energy sales volume). ACIL's report also makes a passing reference to the 2009 RIS for MEPS and Labelling for Televisions.

Other important sources of information on the impact of energy efficiency policy measures appear to have been overlooked by either or both ACIL and the AER.

MJA has briefly reviewed the relevant RIS for each individual policy measure to confirm it was prepared in compliance with COAG (or Victorian Government) *Best Practice Regulation Handbook*, and to ascertain whether there are reasons why information in each RIS might have been overlooked, or accorded lower value by the ACIL and the AER. MJA has also prepared a summary of energy savings estimates developed in support of the energy efficiency policy initiatives. This summary is shown in Table 2 and Table 3 below.

⁴⁴ Despite the deficiencies in ACIL's approach identified above, the difference between NIEIR's and ACIL's estimates for all 5 distributors over the 5 year period is less than 3% (2,370 GWh in aggregate for NIEIR and 2,436 GWh for ACIL). Allocating the lighting MEPS RIS energy savings in proportion to total historical jurisdictional energy consumption would yield a 5 year aggregate of approximately 2,720 GWh for Victoria, which is at least 10% higher than both NIEIR's and ACIL's estimates.

The figures for energy savings from each RIS have been used to develop indicative savings estimate for Victoria during the forthcoming regulatory period, pro-rated based on Victoria's share of national electricity consumption.⁴⁵ This methodology assumes a gradual reduction in Australian electricity generation emissions intensity (used to convert CO₂ savings to GWh equivalent). Where the RIS has provided multiple scenarios, the base scenario, or average of likely scenarios, has been used and estimated annual savings reported in the RIS have been apportioned over the regulatory period assuming a flat profile for simplicity.⁴⁶

MJA acknowledges that the method adopted to allocate energy savings to Victoria is far from perfect (although in MJA's view it is more robust than the approach adopted by ACIL to estimate 'lighting MEPS' impacts). MJA also acknowledges that a much better method would be, as ACIL suggests, to 'de-construct' the RIS estimates, or to develop an independent estimate that was 'fit for purpose'. However, the intent of developing the 'indicative' energy savings estimate for Victoria is not to provide an alternative to NIEIR's estimate (or to ACIL's). The purpose is to illustrate that Governments have explicitly intended this suite of energy efficiency policies to have a material impact on energy consumption; and to demonstrate that it is reasonable for both UED and the AER to take this into account in the respective 'business planning' processes.

The total indicative energy savings for the 2010-15 period from the tables below is some 13,860 GWh. Given that the measures primarily target the residential and commercial sectors, it is reasonable to assume that a majority of savings would occur in distribution connected customers' premises. This figure excludes energy savings that could be attributed to the:

- (ill-fated) Home Insulation Program, which may impact on electricity sales volumes in Victoria in the order of 2,300 GWh over the 5 year period;⁴⁷
- solar PV installations post 2010, which may reduce energy consumption by around 143 GWh over the 5 year period (NIEIR's estimate);⁴⁸
- AMI roll-out, which is likely to directly reduce energy consumption 'modestly';⁴⁹ and

⁴⁵ Victoria's share of national consumption based on ABARE data is 23.2% (p. 20, *Energy in Australia 2010*, ABARE, April 2010 (the figure for 2008 was 23.4%)).

⁴⁶ MJA acknowledges that it would be preferable to avoid this simplification by taking account of the penetration rate and the turnover of existing appliance, equipment and building stock (for example) – which is a feature of NIEIR's modelling.

⁴⁷ MJA has been unable to obtain information confirming the number of Victorian homes that participated in the Home Insulation Program. DCCEE confirmed that information is available, but declined to provide the information to MJA during the "Caretaker" period prior to the Federal Election on 21 August 2010.

The 2,300 GWh figure for Victoria is based on the assumption that 50% of the 27Mt_{CO₂-e} GHG savings estimated by DCCEE can be attributed to electricity savings, and this is equivalent to 1,685 GWh (at a GHG intensity of ~0.8t/MWh), and the savings are distributed amongst the 1.2 million participating dwellings in proportion to total dwellings in each jurisdiction (i.e. that average energy savings per dwelling are the same for each jurisdiction; and the same proportion of dwellings participated in each jurisdiction). In the case of Victoria, these assumption yields average electricity savings estimates of 1,400 kWh/y for 330,000 participating dwellings.

⁴⁸ As noted above, outcomes from the current solar PV 'incentive scheme' are uncertain over the 2011-15 period. While the recent high rates of installation will decline as the 'incentive' reduces and market penetration increases, it is possible that 'consumer sentiment' and sustained marketing of 'bulk purchase' arrangements could see total installed Solar PV capacity being much higher than assumed by NIEIR.

⁴⁹ MJA notes that AMI RIS prepared for COAG in 2008, and the Victorian Government AMI cost-benefit analysis report of 2005, contain estimates for energy savings (and load shifting) attributed to an AMI roll-out that can reasonably described as modest. However, no account has been taken in either analysis of the potential for

- energy efficient public lighting, which could reduce energy consumption by up to 240 GWh over the 2011-2015 period if all 79 Victorian councils decide to replace all MV80 lighting assets over a 4-year period from 2012 - 2015.⁵⁰

A reasonable interpretation of information presented to Government when deciding to pursue these policies is that the total cumulative impact of the policy measures over the 2010-15 period could be of the order of 16 TWh, which is substantially higher than the estimate initially prepared by NIEIR (of 5.7 TWh).

As noted above, MJA does not assert that the 16 TWh figure represents a better or more accurate estimate of energy savings than the estimate produced by NIEIR. However, the summary in Table 2 and Table 3 below does confirm that policy makers intended to achieve material reductions in electricity consumption over the 2011-15 period.

Victorian consumers to respond to non-price information (or 'translate' their experience in water savings to the electricity sector).

⁵⁰ Victoria's councils have adopted a target of achieving roll-out of energy efficient public lighting within a four-year 'maintenance cycle'. If achieved, this that would produce the maximum reduction in energy sales volume in the 2011-15 period. MJA is aware that at least 2 councils have already committed to funding roll-out of energy efficient lighting to replace MV80 assets; and that at least some property developers are installing energy efficient lighting in new subdivisions. However, no formal decision has been taken by the Victorian Government to support complete replacement of all MV80s and some councils may decide not to proceed with the roll-out without Government support.

Analysis undertaken by MJA for DSE shows that at current estimated costs and benefits, investment in energy efficient lighting is 'marginal' for some councils without a 'carbon reduction benefit (such as inclusion in the VEET scheme). Any significant real increases in wholesale energy costs (above CPRS trajectory) or network volumetric tariff prices would improve the business case for roll-out.

Table 2: Minimum Energy Performance Standards (MEPS) Regulations in Australia - Overview⁵¹

| MEPS | Implementation dates | Summary of RIS energy savings estimates | RIS estimate of savings | Indicative savings for Victoria during regulatory period |
|---|---|---|--|--|
| Refrigerators and freezers ⁵² | From 1 October 1999. Revised 1 January 2005 and 1 April 2010. | Decision RIS (October 2008) <ul style="list-style-type: none"> Refrigerators and freezers make up 13.4% of consumption in Australia (estimate for 2005). Set to decrease to 9.3% in 2020. AU wide expected savings by year (2010: 7 GWh/yr, 2015: 54 GWh/yr, 2020: 106 GWh/y). Projected 225,446 refrigerator sales (total stock) in VIC by 2015, assumed 16 year life. Projected 24,436 freezer sales (total stock) in VIC by 2015, assumed 20 year life. | 54 GWh Cumulative 2010 to 2015 | 11 GWh |
| Mains pressure electric storage water heaters ⁵³ | From 1 October 1999); small mains pressure electric storage water heaters (<80L) and low pressure and heat exchanger types (from 1 October 2005). | Consultation RIS (December 2009) <ul style="list-style-type: none"> Hot Water accounts for nearly 23% of the energy used in Australian households in 2008 11.8 Mt CO₂ cumulative savings between 2011 and 2020 <p>Note:</p> <ol style="list-style-type: none"> 5 Star and 6 Star building regulations mandate exclusion of electric water heaters where mains gas is available (and gas water heating is required to achieve Star rating of building shell). NIEIR have factored in the exclusion of EHW where mains gas is available, assuming a 6.7% replacement rate (all electric in gas areas will be replaced after 15 years). | 11.8 Mt CO ₂ Cumulative 2011 to 2020 | 1,745 GWh |

⁵¹ <http://www.energyrating.gov.au/meps1.html>

⁵² Table 3, p. 96, *Equipment Energy Efficiency Committee - Decision Regulatory Impact Statement Household Refrigerators and Freezers*, Energy Efficient Strategies, October 2008

⁵³ Table 38, p. 101, *Regulation Impact Statement: for Consultation Phasing Out Greenhouse-Intensive Water Heaters in Australian Homes*, George Wilkenfeld and Associates, December 2009

| MEPS | Implementation dates | Summary of RIS energy savings estimates | RIS estimate of savings | Indicative savings for Victoria during regulatory period |
|--|--|--|------------------------------------|--|
| Three phase electric motors (0.73kW to <185kW) ⁵⁴ | From 1 October 2001. Revised April 2006. | Draft RIS for proposal (Nov 2003), unable to find more recent RIS: <ul style="list-style-type: none"> Measures required about 70% of the then existing models to be withdrawn from the market. The energy savings compared with BAU were expected to peak in 2012 at about 570 GWh/yr (Australia wide). MEPS (applicable from April 2006) range from about 70% efficiency (0.73 kW, 8 pole motors) to about 95% efficiency (185 kW 8 pole motors). | 570 GWh Annual in 2012 | 666 GWh |
| Single phase air conditioners ⁵⁵ | From 1 October 2004. Revised 1 April 2006, 1 April 2007, 1 April 2008, 1 April 2010 and 1 April 2011. | Consultation RIS (June 2010) <ul style="list-style-type: none"> AC sales increasing from 210,000 units in 2010 to 230,000 in 2015. Approx 70% units to Residential (households), 30% Commercial/Industrial. Total households with AC increasing from 1.775M in 2010 to 1.956M in 2015 (cf 1.300M in 2000). Increase in penetration 2010-2015 (~2% /year) higher than population and household growth. Average life 15-20 years. Average demand not specified. AC penetration has increased from 30.9% of households in 1999 to 48.9% in 2008. Heating and Cooling efficiency to increase by 10% from April 2010 (and, recommended, by a further 10% in 2014). Energy impact of Commercial/Industrial AC “outweighs” Residential. No details of energy savings for VIC. Energy savings for AUS projected at 425GWh (compared to 19,000GWh/yr by 2015 with no change in MEPS). | 425 GWh Cumulative 2011 to 2015 | 99 GWh |
| Three phase air conditioners up to 65kW cooling capacity ⁵⁶ | From 1 October 2001. Revised 1 October 2007, 1 April 2010 and 1 April 2011. | See comments on Single Phase Air conditioners above. | See above | See above |

⁵⁴ Figure 4.1, p. 17, *Minimum Energy Performance Standards for Electric Motors Draft Regulatory Impact Statement*, Syneca Consulting, November 2003

⁵⁵ Table 8, p.36, *Consultation Regulatory Impact Statement: Minimum Energy Performance Standards for Air Conditioners: 2011*, EnergyConsult, June 2010

⁵⁶ See above.

| MEPS | Implementation dates | Summary of RIS energy savings estimates | RIS estimate of savings | Indicative savings for Victoria during regulatory period |
|---|---|---|--|--|
| Ballasts for linear fluorescent lamps ⁵⁷ | From 1 March 2003). | <p>Draft RIS for public comment (Feb 2001), unable to find a more recent RIS:</p> <ul style="list-style-type: none"> At time of RIS, 21% of fluorescent lighting energy was related to control ballast losses – about 2,540 GWh Recommended options (2a, 2c – not sure which one was adopted) energy savings from 2001 – 2015 projected to be 8 TWh to 11.5 TWh. <p>Note: In addition to MEPS, ballasts also have to be marked with an energy efficiency index (EEI).</p> | 8 TWh to 11.5 TWh Cumulative 2001 to 2015 | 759 GWh |
| Linear fluorescent lamps ⁵⁸ | From 1 October 2004 for 550mm to 1500mm inclusive with a nominal lamp power >16W. | <p>Final RIS (December 2003):</p> <ul style="list-style-type: none"> Estimated that half of the halophosphate lamp stock is eliminated in the first four years of MEPS (equal to the average lifetime of halophosphate lamps). 0.5 to 3.1 Mt CO₂e cumulative savings between 2005 and 2020. <p>Note: Preliminary estimate of savings for VIC around 400 GWh.</p> | 0.5 to 3.1 Mt CO ₂ e Cumulative 2005 to 2020 | 131 GWh |
| Distribution transformers ⁵⁹ | From 1 October 2004 for 11kV and 22kV with a rating from 10kA to 2.5MVA. | <p>Proposal to increase MEPS Levels (Technical Report October 2007):</p> <ul style="list-style-type: none"> Proposal to increase local transformer efficiency level MEPS to new level consistent with international levels. Example provided for 1000 kVA transformer, 16 kWh daily energy saving (5.8 MWh / annum). | n/a | n/a |

⁵⁷ Table 19, p. 57, *Regulatory Impact Statement: Minimum Energy Performance Standards and Alternative Strategies for Fluorescent Lamp Ballasts*, George Wilkenfeld and Associates, February 2001

⁵⁸ Figure 19, p. 25, *Regulatory Impact Statement: Minimum Energy Performance Standards and Alternative Strategies for Linear Fluorescent Lamps*, Mark Ellis & Associates, December 2003

⁵⁹ RIS prepared by George Wilkenfeld and Associates, dated January 2002. Energy savings reduce network losses, but have no impact on estimated sales volumes, and have been excluded from the table.

| MEPS | Implementation dates | Summary of RIS energy savings estimates | RIS estimate of savings | Indicative savings for Victoria during regulatory period |
|--|--|--|---|--|
| Commercial refrigeration ⁶⁰ | From 1 October 2004 for self contained and remote systems. | <p>Draft strategic plan (October 2009):</p> <ul style="list-style-type: none"> • Non-domestic refrigeration consumed approximately 13,400 GWh in 2008 (Australia). • Responsible for 13.7 Mt CO₂. • Strategy includes a range of policy measures, including the provision of information and voluntary and regulatory initiatives. • Strategy is expected to reduce annual consumption by 14% in 2020 (3,300 GWh) or 2.5 Mt CO₂. • Timeline: it is expected that regulatory policy measures require a period of between 2-3 years (minimum) from the commencement of development tasks to the time they come into force. <p>Draft RIS for public comment (February 2004):</p> <ul style="list-style-type: none"> • Proposed measure expected to achieve GHG abatement between 1.5 to 2.4 Mt CO₂ equivalent (approximately 1,500 to 2,400GWh/year).⁶¹ | 1.5 to 2.4 CO ₂ e Cumulative 2005 to 2020 | 159 GWh |
| Incandescent Lamps ⁶² | From November 2009 (Halogen transformers from 2010). | <p>Decision RIS on proposed MEPS for incandescent lamps, compact fluorescent lamps and voltage converters (May 2009):</p> <ul style="list-style-type: none"> • Import restrictions on GLS lamps commenced from 1 February 2009 • Point of sale MEPS for GLS, extra low voltage halogen, non reflector and CFL non reflector applied from November 2009 • Additional measures on other low efficiency lamps are planned but subject to review • Nationwide cumulative energy saving of 30,305 GWh from 2008 to 2020 | 30,305 GWh Cumulative 2008 to 2020 | 2,723 GWh |

⁶⁰ *Regulatory Impact Statement: Minimum Energy Performance Standards and Alternative Strategies for Commercial Refrigeration Cabinets in Australia and New Zealand*, Mark Ellis & Associates with Steven Beletich Associates, February 2004

⁶¹ Similar use of the term "CO₂ equivalent" in the executive summary of the RIS (p.vi) implies this refers to CO₂ savings resulting from reduced electricity consumption due to energy efficiency improvements.

⁶² Table 2, p.13, *Regulatory Impact Statement for Decision - Proposed MEPS for incandescent lamps, compact fluorescent lamps and voltage converters*, Department of the Environment, Water, Heritage and the Arts, May 2009.

| MEPS | Implementation dates | Summary of RIS energy savings estimates | RIS estimate of savings | Indicative savings for Victoria during regulatory period |
|--|---|--|--|--|
| Compact Fluorescent Lamps ⁶³ | From November 2009 (November 2008 for certain types). | See comments on Incandescent Lamps above. | See above | See above |
| External Power Supplies ⁶⁴ | From 1 December 2008. | Second consultation RIS (December 2007): <ul style="list-style-type: none"> In Australia, external power supplies' standby energy and conversion losses consumed an estimated 845 GWh (2004). Annual sales growth scenarios modelled between 5% (conservative) growth to 6%-11% (high industry forecast) growth. Energy savings estimated at between 8,536 GWh to 11,459 GWh (2007 to 2025) | 8,536 GWh to 11,459 GWh Cumulative 2007 to 2025 | 614 GWh |
| Set top boxes ⁶⁵ | From 1 December 2008. | Decision RIS (June 2008): <ul style="list-style-type: none"> Australian electricity consumption of STB for 2006 was estimated to be 500 GWh/yr. Base case energy savings of 1,561 GWh for Australia (to 2020). | 1,561 GWh Cumulative 2009 to 2020 | 152 GWh |
| Televisions ⁶⁶ | From 1 October 2009. | Final RIS (May 2009): <ul style="list-style-type: none"> Tier 1 from 1 October 2009. Tier 2 (more stringent 3 or 4 star MEPS) from 1 October 2012. Energy saving from 2007 to 2020 (Australia) of 34.1 TWh (Tier 2 at 3 stars) to 40.1 TWh (Tier 2 at 4 stars). | 34.1 TWh to 40.1 TWh Cumulative 2007 to 2020 | 3 GWh |
| Commercial Building Chillers ⁶⁷ | From July 2009 | Decision RIS (July 2008): <ul style="list-style-type: none"> 2006 (Australia) consumption estimated to be 4.9 TWh/yr Base case energy savings from 2007 to 2020 estimated as 2,862 GWh. | 2,862 GWh Cumulative 2007 to 2020 | 239 GWh |
| Close Control Air Conditioners ⁶⁸ | From July 2009. | Decision RIS (December 2008): <ul style="list-style-type: none"> Annual Australian electricity consumption from CCAC estimated to be 1,380 GWh/yr for the year 2006 Base case energy saving of 1,748 GWh (from 2007 to 2020) | 1,748 GWh Cumulative 2007 to 2020 | 146 GWh |

⁶³ See above.

⁶⁴ Table 44, p.52, *Second Consultation Regulatory Impact Statement: Proposed Minimum Energy Performance Standards for External Power Supplies*, Punchline Energy, December 2007

⁶⁵ Table 18, p.56, *Decision Regulatory Impact Statement: Minimum Energy Performance Standards and Alternative Strategies for Set-Top Boxes*, EnergyConsult, June 2008

⁶⁶ p.xviii, *Regulatory Impact Statement: Proposed Minimum Energy Performance Standards and Labelling for Televisions*, Digital CEnergy Australia, May 2009

⁶⁷ Table 16, p.57, *Decision Regulatory Impact Statement: Minimum Energy Performance Standards and Alternative Strategies for Chillers*, EnergyConsult, July 2008

⁶⁸ Table 15, p. 55, *Decision Regulatory Impact Statement: Minimum Energy Performance Standards and Alternative Strategies for Close Control Air Conditioners*, EnergyConsult, December 2008

| MEPS | Implementation dates | Summary of RIS energy savings estimates | RIS estimate of savings | Indicative savings for Victoria during regulatory period |
|--|---------------------------|---|-------------------------|--|
| Transformers and Electronic Step-down Converters for ELV Lamps ⁶⁹ | Proposed for October 2010 | See comments on Incandescent Lamps above. | See above | See above |

Source:

Table 3: Building standards⁷⁰ and Victorian Energy Efficiency Target (VEET) Regulations in Australia – Overview

| Policy | Implementation dates | Summary of RIS energy savings estimates | RIS estimate of savings | Indicative savings for Victoria during regulatory period |
|--|----------------------|--|---|---|
| Revised Energy Efficiency Requirements of the Building Code of Australia ⁷¹ | May 2011 | Decision RIS (December 2009) <ul style="list-style-type: none"> Residential savings of 800 GWh in 2020 Commercial savings of 1,379 GWh in 2020 | Residential 800 GWh Annual in 2020 Commercial 1,379 GWh Annual in 2020 | Residential 935 GWh Commercial 1,611 GWh |
| VEET ⁷² | 1 January 2009 | Consultation RIS (September 2008) <ul style="list-style-type: none"> 0.78 Mt of average annual GHG abatement over the first scheme phase (2009 to 2011) | 0.78 Mt CO ₂ Annual | 3,900 GWh |

⁶⁹ See comment on incandescent lamps above.

⁷⁰ The RIS documents for the building standards were commissioned by the Australian Building Codes Board. The document posted on the ABCB Website is presumed to relate to the revision from 5 Star to 6 Star building standards. MJA has not examined energy saving estimates prepared for the 5 Star RIS, since the NIEIR and AER arguments focuses more around the incremental saving of moving to 6 star.

⁷¹ p. 231, *Final Regulation Impact Statement for Decision Proposal to Revise the Energy Efficiency Requirements of the Building Code of Australia for Residential Buildings – Classes 1, 2, 4 and 10*, Centre for Independent Economics, December 2009

⁷² Table 7.3: *Regulatory Impact Statement for Proposed Victorian Energy Efficiency Target Regulations*, Victorian Department of Primary Industries, September 2008

3.4. Conclusions

The information in Table 2 and Table 3 clearly shows that the energy efficiency policies implemented by the Australian and Victoria Governments were intended to produce material reductions in electricity consumption in the 2005-10 period. The impacts of these policies are sufficiently material to account for some of the reduction in electricity sales volume growth observed by UED, and should be taken into account in UED's business plans.

Confirmed policy changes, and others where reviews have been confirmed by Governments, are intended to intensify those impacts in the 2011-15 period and beyond. Furthermore, despite the AER's doubts about the impacts from the AMI roll-out, that program is also intended to affect both peak demand and energy consumption during the 2011-15 period.

Given these conclusions, it is MJA's considered view that the AER should accept the adjustments to UED's energy sales volume forecasts by at least the amounts indicated in NIEIR's modelling.

4. Factors influencing consumer response to energy efficiency policies

MJA has shown in previous sections of this report that the outcomes from the suite of Government energy efficiency policies are intended to be material. However, the actual outcome is uncertain, and this uncertainty creates a business risk that UED should address in its business plans.

Specifically, the policy measures themselves do not ensure that consumers will do what the policy makers intend – and reduce energy consumption. Consumers have a choice other than to reduce energy consumption in response to these policy initiatives. They could, for example, cause what NIEIR and ACIL refer to as ‘rebound’ and choose greater levels of service or comfort by:

- continuing the trend of the last 2 decades (or more) and build increasingly larger houses that require more energy, even though those houses are constructed at more energy efficient standards;
- buying more or larger air conditioners than needed to cool (or heat) their increasingly energy efficient homes - and/or use those air conditioners for longer periods each year to achieve greater levels of comfort; or
- increasing the numbers of TVs or computers in their homes.

Alternatively, response to these policies could result in increases in energy efficiency that reduce energy sales volume more than assumed by the distributors and estimated by NIEIR (and possibly even more than intended by the policy makers). For example:

- consumers could replicate outcomes from the water sector and choose to reduce energy consumption even more than policy makers have assumed;
- Governments could move even more ‘aggressively’ on energy efficiency measures in the face of the inertia that is preventing implementation of a comprehensive carbon pricing regime.

This possibility is supported by clear statements that COAG intends to:

“... set out a clear process and timetable for periodic review (for example, every three years starting in 2012) of energy efficiency standards so that over the life of this strategy energy efficiency requirements will be progressively increased. This will give industry greater confidence to innovate and develop affordable solutions to improve building energy efficiency. For example, six, seven and eight star buildings, or equivalent, will become the norm in Australia, not the exception.”⁷³

- The Victorian Government has already confirmed that it will accelerate introduction of 6 Star building standards ahead of the timetable agreed by COAG and require all new dwellings to meet increased building shell energy performance requirements from May 2011.⁷⁴

⁷³ p. 22, *National Strategy on Energy Efficiency*, COAG, July 2009.

⁷⁴ See: <http://www.premier.vic.gov.au/component/content/article/10190.html>.

- The Victorian Government has also announced⁷⁵ that it intends to substantially increase energy efficiency measures, including through:
 - providing \$41 million in funding to private sector-led projects at the pilot and R&D stages for (eligible) technologies including renewables, smart grid technologies and energy efficiency for the commercial and industrial sector.
 - setting a goal of improving the energy efficiency of Victoria’s existing housing stock to an average 5 Star equivalent energy rating by 2020 (when older homes usually have poor energy efficiency, with an energy rating of only 1 to 2 Stars).
 - seeking to double the target of the Victorian Energy Saver Incentive and expand the list of eligible energy efficiency activities, subject to a RIS.
 - delivering a comprehensive household retrofit program to assist Victorian householders to reduce their energy consumption through energy efficiency upgrades, including support for low income households and public housing tenants;
 - launching a new website to give households detailed information on opportunities to save energy and obtain Government rebates;
 - advocating to the Commonwealth for the commencement of the \$35 million GreenStart program in Victoria to provide further energy efficiency improvements for low-income households;
 - extending the Victorian rebate scheme for installation of solar hot water systems to help households reduce their energy bills and emissions, complementing the Commonwealth Government’s rebates.
 - seeking to improve energy efficiency by a further 20% across all government buildings and facilities including hospitals, schools and offices by 2018.
 - extending feed-in tariffs to large scale concentrated solar power generation.

MJA notes that some of the above policy proposals are ‘aspirational’ (in that they set ‘goals’ but do not commit to explicit changes in law) or ‘conditional’ (for example, subject to a RIS).

However, the Victorian Government has demonstrated a commitment to existing policy measures that exceed the requirements of the COAG Energy Efficiency Strategy. Therefore, in MJA’s view, it is reasonable to assume that some or all of these policy initiatives will be implemented. If that is the case, some of the policies (such as the expanded VEET and (concentrated) solar feed-in tariffs) will add to the increased electricity service costs attributed to the AMI roll-out, and that will reinforce the benefits to be derived by consumers responding positively to energy efficiency policies.

There is, in MJA’s view, no doubt that Governments have explicitly intended that the suite of energy efficiency policies listed in the previous section of this report would lead to actual and material reductions in electricity consumption. Nor is there any doubt that the impact of these policies will increase and compound over the coming decade as older less efficient appliances and equipment are replaced and more existing dwellings are upgraded to 6 Star building standards (and commercial buildings upgraded to higher, ‘greener’ standards). But the questions remain:

⁷⁵ Taking Action for Victoria’s Future, Victorian Climate Change White Paper - The Action Plan, Department of Premier and Cabinet, July 2010

- Will consumers continue to respond - as UED's reported energy sales volumes show they are responding currently - to increasingly demanding energy efficiency policy measures by decreasing electricity consumption?
- What evidence exists to support the assumption that they will continue to respond as policy makers intend?

MJA notes that discussion of issues related to these 2 questions in ACIL's and NIEIR's reports, and in the AER Draft Decision, focuses almost entirely on the effect that 'efficient pricing' would have on consumers. MJA agrees that network and energy tariffs should be based on rational and reasonable economic principles and 'efficient' tariff structures. However, there are other factors that could ensure consumers do respond as policy makers intend. Each of these is discussed briefly in the sections below.

4.1. Reducing electricity consumption is a practical option

The first factor that will influence consumer response to increasing energy efficiency policies is that, even without tariff reform (or, indeed, the AER's acceptance of UED increased tariff proposals), it is inevitable that the total cost to consumers of electricity services will continue to rise in real terms over the coming regulatory period.

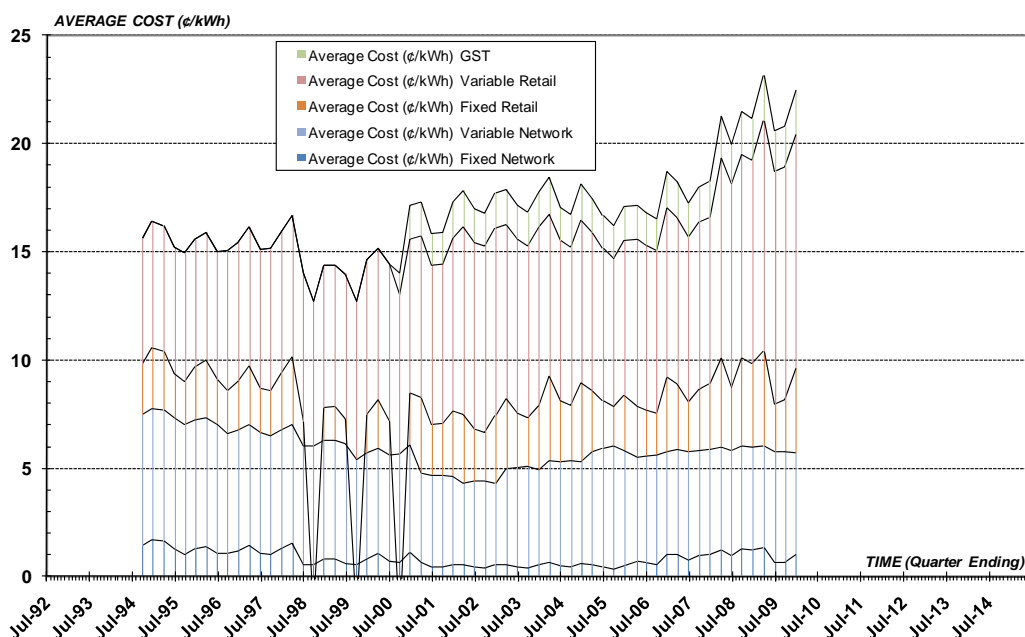
The diagram below shows how actual energy component prices have changed since the early 1990s for one 'real' household in Melbourne. Network component costs have remained (more-or-less) constant in nominal terms since the late 1990s while retail component costs have increased by some 40% in nominal terms – even with access to retail competition. The data plotted on this figure does not yet include the costs for the AMI rollout (in the data plotted). When this charge is added (in the next bill according to the household's retailer), the Fixed Network charge component (to which metering charges have been allocated in this analysis), will more than double to around 4¢/kWh – approaching 20% of the total bill.

It is MJA's view that increases in retail electricity costs over the last decade will continue over the next 5 years or more because:

- wholesale electricity spot prices and contract/futures prices are not providing sufficient margins (above expected long-run marginal cost of potential new generator entrant) to overcome the uncertainty created by delay in resolving a credible carbon-pricing regime;
- generator owners will hesitate to invest in the capacity needed to meet increasing peak demand;
- this will, inevitably, lead to higher wholesale market prices as generator capacity margins are further eroded by rising peak summer demand; and
- the higher energy prices will continue to impact on consumers as they have for the past decade (as illustrated in Figure 4 below).

That is, it is reasonable to assume that wholesale and retail electricity prices will increase in the short to medium term even without an effective carbon pricing mechanism being implemented.

Figure 4: Cost components of actual household electricity bill.



Source: Actual household electricity bills for Residential consumer in Citpower's service area, with component rates back-calculated from published Network and Retail Tarrif rates and metering charges.

Notes:

- The "dips" in the period from 1998 through 2000 represent the Kennet Government's \$60/year Winter Energy Concession.

In addition, this household – like all others in Victoria - faces substantial increases in costs because of increases in water charges, local council rates, insurance and other 'normal' living costs. It is the cumulative total of these individual costs that consumers are most likely to consider when they make consumption choices. Individual tariff prices for one service are important 'reminders' to consumers, but they are almost certainly less important than the total cumulative cost.

It is MJA's view that re-structured retail tariffs that deliver substantial benefits to consumers who are prepared to radically alter their energy use patterns are extremely unlikely to emerge in a competitive retail market. The only way that households and businesses will be able to reduce or maintain total annual electricity costs is to take advantage of Government energy efficiency policies and reduce total consumption of electricity wherever and whenever they can.⁷⁶

⁷⁶ The household in this example faces a "standard" 2-part retail tariff comprising a fixed Service Charge and variable "Peak" energy charge – even though supply is metered with a half-hourly meter. MJA has analysed the impact of shifting to different retail tariff structures (using the half hourly metered data). This analysis demonstrates that shifting to an alternative product would be very modest unless a significant portion of total load could be shifted to an Off-Peak tariff time, which has proved to be impossible.

4.2. Increasing environmental awareness

A second factor that is likely to influence consumer response is an increasing environmental awareness, reinforced by the lessons learned by energy consumers from their experiences in the water sector.

Consumer response in the absence of modified price signals has been very marked in the water sector. Substantial and sustained reductions in total water consumption have been effected by a combination of:

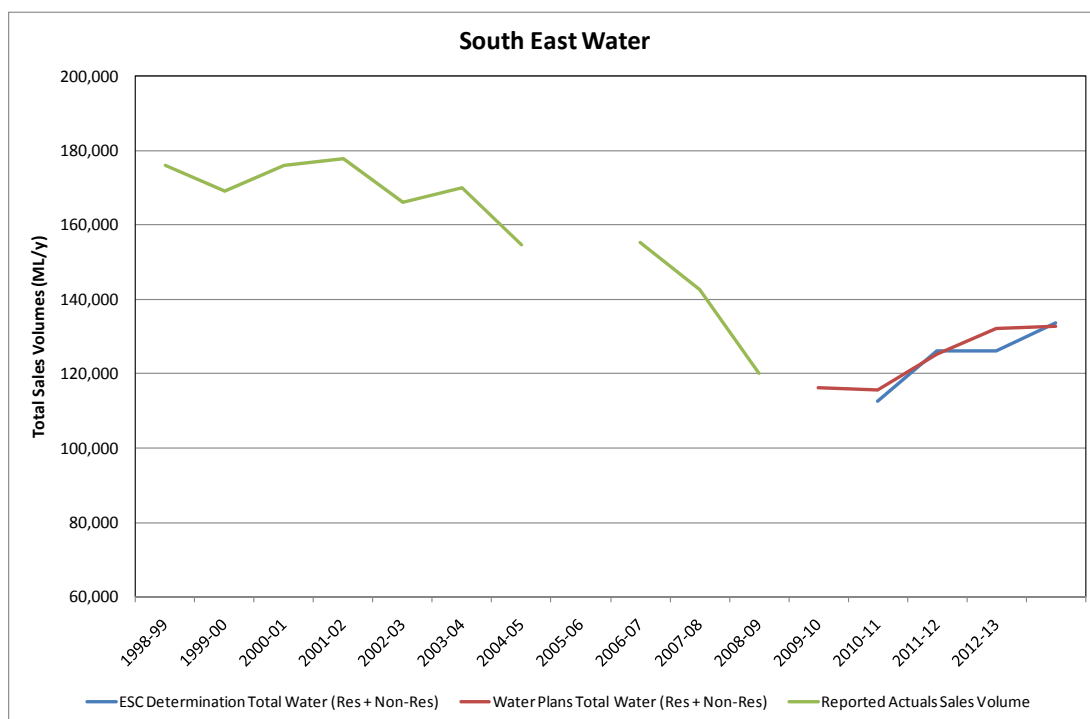
- public education, including publication of consumption targets and water supply levels, usage recommendations (such as installation of drip irrigation for gardens), and mandating appliance Star ratings;
- both mandatory and voluntary improvements in water use efficiency of appliances (through the equivalent of MEPS and appliance Star Ratings);
- development of new technologies (particularly grey water) and alternative supply (e.g. water tanks); and
- both mandatory and voluntary appliance change-over programs.

The outcomes in the water sector have been assisted and reinforced by very direct 'public education' through imposition of water use restrictions across much of Victoria and by public announcements of increasing tariff rates. However, evidence shows consumer behaviour was markedly affected prior to imposition of restrictions and price increases; and is highly resilient in that consumption 'rebound', which is occurring at low or negligible levels (or not at all) even where restrictions have been removed.

For example, as illustrated in Figure 5 below, information published by the ESC shows total water consumption in Melbourne's three 'retail' water supply areas declined by up to 30% in the decade prior to introduction of Stage 1 water restrictions in August 2006, despite significant increases in population and connections. Water restrictions were increased to Stage 3a over the following 6 months helping to push down total water consumption a further 20% (approximately) in the following 2 years. The ESC has subsequently accepted forecasts that show total consumptions staying flat or rising only slightly over the period to 2014 – even though restrictions are expected to be removed well before then.

MJA acknowledges that consumers have differing perceptions of energy use and water use. However, it is also MJA's view that those perceptions will become more closely aligned due to concerns about climate change (and the public education programs that promote the environmental benefits of reduced energy consumption).

Figure 5: Total water sales volumes for South East Water.



Source: Water industry Performance Reports and Water Price Decisions, Essential Services Commission.

Notes:

- South East Water was selected for this illustration because its service area overlaps with UED's. Similar outcomes are reported by all three Metropolitan water businesses and by all Regional Urban businesses.
- Total customer numbers (connections) increased by 23.5% (from 507,000 to 626,224) from 1998/99 to 2009/10 and are forecast to increase by a further 5.6% (to 661,369) in 2012/13.
- Average consumption per customer decreased by 46% from 1998/99 to 2009/10 and is forecast to increase by only 2.6% above 2009/10 levels by 2012/13.
- Average consumption per customer for the other 2 Metropolitan water businesses is forecast to continue decreasing (slightly) to 2012/13.
- Reporting of actual consumption volumes will determine whether or not South East Water has taken on a higher level of risk (related to uncertainty in consumer response) than other Metropolitan businesses.

4.3. Improvements in consumer information

MJA is of the view that it is reasonable to assume information obtained from the AMI rollout will be conveyed to consumers in a manner that they find useful. This would reinforce public messages that link energy conservation to reducing climate change impacts, and consumers will respond by reducing energy consumption (an outcome made 'easier' by the increasing penetration of policy driven energy efficiency measures).

MJA is aware that a number of energy utilities across Australia have undertaken trials that examine the impact of AMI (or 'Smart Meters'), alternative tariff structures and various approaches to 'load management'. Brief outlines of these activities are presented regularly

at conferences around Australia. However, little detail of the trials or their results has been published.⁷⁷

However, there is other information in the public domain that supports the view that consumers will respond to focussed information and reduce energy consumption. NIEIR provides a very brief summary of a survey undertaken by the Brattle Group of evidence from the 15 most recent experiments with dynamic pricing of electricity. These studies found conclusive evidence that households (residential customers) respond to higher prices by lowering usage.⁷⁸

Another particularly useful resource is a report published by the American Council for an Energy Efficient Economy (ACEEE) in June 2010.⁷⁹ This report deals entirely with trials undertaken in the residential sector and consolidates information collated from 57 primary studies undertaken over the period of 36 years from 1974, mainly in the USA, Europe and Canada, but also including a small number of trials undertaken in Japan and one trial undertaken in Australia (in 1984).

A particular focus of the report is the effect that type of feedback provided to consumers has on changing consumption behaviour. The report does not have a narrow economic focus on price signals, but is concerned with all forms of information provided to consumers and the consumers' response to this information. The types of feedback (using classifications developed by EPRI in 2009) are listed as:

- Standard Billing: an energy bill that displays the monthly kilowatt-hour (kWh) of consumption and the unit rate (\$/kWh), the corresponding total cost and other billing charges, as well as the total amount due. This form of feedback generally lacks comparative statistics or any detailed information about the temporal aspects of consumption.
- Enhanced Billing: an energy bill that provides more detailed information about energy consumption patterns, and often includes comparative statistics - either comparing the most current monthly electricity usage and expenditures together with historical consumption and/or a comparison to other households.
- Estimated Feedback: an approach that uses statistical techniques to disaggregate the total energy usage based on a customer's household type, appliance information, and billing data. The resulting feedback provides a detailed account of electricity use by major appliances and devices, and is commonly in the form of web-based "home energy audits" offered by utilities to their customers.
- Daily/Weekly Feedback Reports: these reports use averaged data and often include consumer self-read studies (in which individuals read their meter and record the energy usage themselves) as well as studies in which individuals are provided with daily or weekly consumption reports from a utility or research entity.
- Real-Time Feedback: in-home energy display devices that provide real-time or near real time energy consumption and energy cost data at the aggregate household level.

⁷⁷ MJA has approached DCCEE as the agency with responsibility for overseeing the Solar Cities program seeking access to reports on the trials. The Department acknowledged it was receiving these reports but declined to release them into the public domain at this time.

⁷⁸ p. 70, NIEIR, June 2010.

⁷⁹ *Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities*, Report Number E105, ACEEE, June 2010.

- Real-Time Plus: in-home energy display devices that provide real-time or near real-time energy consumption and energy cost data disaggregated by appliance.

While many of the studies in the ACEEE report pre-date AMI, the report pays particular attention to AMI trials, noting that:

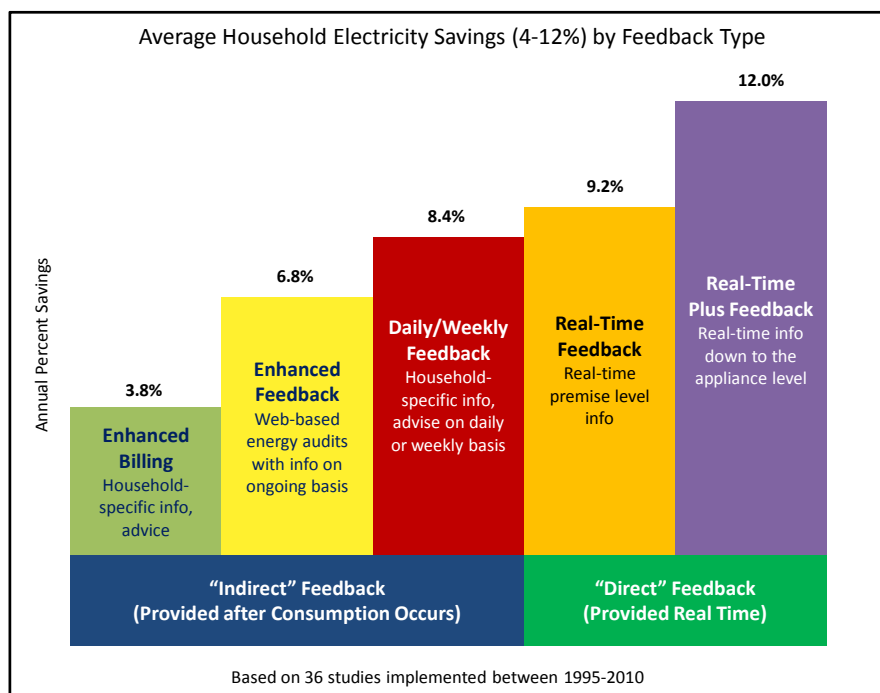
Advanced metering is likely to play an important role in meeting the data demands of feedback programs. While feedback can take many forms and need not include utilities or advanced metering initiatives (AMI), the planned proliferation of advanced meters will provide powerful new opportunities for the collection of detailed, household-level energy use data. In combination with a variety of enabling-technologies (e.g., appliance measurement and automation sensors), AMI could provide households with an expanded array of mechanisms for reducing energy waste and maximizing energy bill savings. Of critical importance, however, is the way in which the feedback is provided and whether people understand the information, believe that they are capable of making a difference, and are motivated to take action. Achieving maximum feedback-related savings will require an approach that combines useful technologies with well-designed programs that successfully inform, engage, empower, and motivate people.⁸⁰

The report also recognises the importance of climate change in stimulating consumer response and identifies 36 studies of trials motivated by this criteria conducted between 1995 and 2009. A significant number of these trials included ‘advanced’ technology. While noting that outcomes from the trials varied,⁸¹ the report summarised the outcomes in the diagram below.

⁸⁰ p. iv, *Op Cit.*

⁸¹ The ACEE reports notes that energy savings tended to reduce as size of the trial group increased and the trial duration extended; and that the average savings from trials with similar feedback tended to decline with ‘epoc’. That is, savings from pre-1995 trials, the majority of which were initiated following the 1970s oil price shocks, were noticeable higher than similar post-1995 trials.

Figure 6: Summary of post-1995 energy savings trials (ACEEE)



Source: p. iii, *Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities*, Report Number E105, American Council for an Energy-Efficient Economy, June 2010

The report conclusions from considering trials with an AMI component were:

Advanced meters alone will not achieve energy efficient behavior change, but with a healthy mix of behavioral science, policy, and enabling-technologies, these technology and networking systems could achieve dramatic energy savings. If utilities begin to recognize the customer as a large resource for demand and cost management, a new utility services paradigm that leaves room for a whole host of new energy management products and services is possible. Now seems to be the time to act to take advantage of the growing public interest in energy and the growing number of products and services available on the market. Notably, however, the electric utility industry as a whole may be moving toward more of a demand-side rather than a purely supply side business perspective in which customer preference will become increasingly important (Galvin Electricity Initiative 2007). Supporting this transition should result in a substantial reduction in energy waste (Galvin Electricity Initiative 2007), which means that the consumer-facing side of the smart grid should be an important consideration in advanced metering deployments.⁸²

It is MJA’s view that this report supports – as reasonable – an assumption that the Victorian AMI rollout will affect energy consumption, particularly if consumers are able to access meaningful information from their AMI meters, and specifically if that information is reinforced by messages that link energy conservation to amelioration of climate change impacts. MJA’s is also of the view that, even without substantial changes in tariff

⁸² p. 36, *Op Cit.*

structures, the increasing cost of electricity supply and other basic services – including the cost of the AMI meter rollout approved by the AER – will reinforce the benefits to consumers of reducing electricity consumption.

A further question arises in respect of who might convey the required messages to consumers. It is not at all clear that that it should be electricity distributors like UED.⁸³ Nor is it clear that electricity distributors should bear the business risk that this uncertainty creates.

Governments have clearly stated their intention to push ahead with further energy efficiency policies; and the Victorian Government is responsible for the decision to mandate roll-out of AMI. On that basis, it is MJA's view that it would be reasonable for UED to assume, in its business planning processes, that Government will act to ensure energy users get every opportunity to benefit from Government policies – particularly when those policies impose substantial costs on consumers. Accordingly, the AER would also be justified in assuming that the AMI program will contribute to the effectiveness of Governments' energy efficiency policies – even if it does not accept that the AMI would deliver material energy savings in addition to those of the energy efficiency policies.

4.4. Conclusions

In previous sections of this report, MJA provided a brief summary of information contained in the many RIS prepared in support of energy efficiency policies implemented by the Australian and Victorian Governments over the last decade. The information in those RIS includes estimates of expected reductions in energy consumption that have been prepared by consultants and policy agencies using methods that meet criteria specified in *Best Practice Regulation Handbook(s)* that have been endorsed by COAG and that are administered by Government oversight agencies.

MJA does not contend that the cumulative RIS estimates of energy saving are 'better' than estimates prepared for UED by NIEIR. MJA has confirmed that most of the RIS estimates are for the whole of Australia, and that most RIS documents do not allocate the energy savings to individual jurisdictions.⁸⁴ However, for the purposes of comparison with NIEIR's estimates, MJA has prepared 'indicative energy savings' estimates by allocating the estimated RIS savings to Victoria in proportion to Victoria's share of total national electricity consumption. This approach is no worse than that adopted by ACIL, and may, in fact, be more robust than allocating a share to Victoria based on Victoria's share of total national housing (which ACIL used to estimate the impact of 'lighting MEPS').

It is clear from this analysis that the magnitude of electricity savings that policy makers intended to achieve is substantially more than the estimate derived by NIEIR using economic models. It is, therefore, possible, even likely, that NIEIR's estimate of the impact of energy efficiency policies is smaller than could actually occur. Indeed, MJA notes that NIEIR states it has been conservative in several of its assumptions (i.e. it has deliberately adopted assumptions that lead to an underestimate of the impact of some policies).

⁸³ For example, energy retailers would be unlikely to support distributors advising the retailers' customers what they customers should be doing with the electricity that the retailers are selling.

⁸⁴ The exceptions are those RIS prepared by or for the Victorian Government. But even those do not contain estimates of energy savings that can be easily disaggregated by distribution service area.

However, MJA was not asked to recommend that UED or the AER adopt a higher figure of 'energy policy savings' than NIEIR initially estimated, and this report recommends only that UED and the AER accept a higher estimate if this is confirmed by NIEIR's revised modelling.

MJA notes that both ACIL and AER expressed reservations about whether the energy savings would be achieved in practice, and specifically rejected the assumption that the AMI roll-out would contribute to energy sales volume reductions. MJA acknowledges that the outcome from these policies may not be as policy makers intend. However, this creates uncertainty for UED that should be treated as a quantifiable risk in UED's business planning. The approach that UED has adopted to quantify this risk, that is by incorporating NIEIR's modelling the impact of these into its regulatory proposal, is both reasonable and prudent in MJA's opinion. Accordingly, it is MJA's view that the results from NIEIR's analysis should be accepted by the AER as complying with the specified requirements of the National Electricity Rules.

5. Findings and Conclusions

This report considers a range of issues arising from the AER's treatment of UED's energy sales volume forecasts. A summary of the findings and conclusions from this review is presented below, which confirm that:

- the approach and methodology recommend by ACIL and adopted by the AER to review and amend population (and customer connection) forecasts in UED's service territory contains a number of shortcomings and obvious errors which confirm that the AER's conclusions and proposed amendments to UED's forecasts should be modified;
- the AER could reasonably rely on NIEIR's revised forecast to estimate population trend impacts on UED's energy sales volumes providing the ABS Series B projections and updated assessments of the Victorian economy are used as a basis for the forecasts;
- Australian and Victorian Governments have implemented a suite of policies that are explicitly intended to significantly and permanently reduce energy consumption across major sectors of the economy;
- the quantum of energy savings that this suite of policies is intended to effect is material; and the impact in Victoria is likely to be significantly greater than forecast by NIEIR to 2015;
- there is *prima facie* evidence to support, as reasonable, an assumption that the AMI roll-out will lead to significant changes in energy consumption, including significant reductions in consumption – provided the AMI program is supported by a well-designed consumer education and awareness program that provides consumer with information that they find helpful in achieving such outcomes;
- while the outcomes from the suite of energy efficiency policies implemented by Governments is uncertain, it is reasonable for UED to base its business planning on an assumption that these policies will materially impact on energy sales volumes;
- it is also reasonable for UED to address this uncertainty and to incorporate a reasonable estimate of the accompanying business risks into its business planning processes; and
- incorporating the results from NIEIR's modelling into UED's business planning processes is a reasonable and prudent way to quantify this uncertainty; and should be accepted by the AER as complying with relevant obligations specified in the National Electricity Rules.