

**RESIDENTIAL ENERGY EFFICIENCY AND MANDATORY DISCLOSURE
PRACTICES**

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ABSTRACT

The mandatory disclosure of residential building energy, greenhouse and water performance is a key goal expressed in Australian government building energy and carbon emission reduction targets. To introduce mandatory disclosure at the point of sale or lease for residential properties requires a real estate industry and wider public consultation where the merits, possible shortcomings and finer details of various schemes and regulatory options are examined. A major issue for the Australian real estate industry going forward, is what will mandatory disclosure look like?

This paper seeks to address this question by an analysis of home energy efficiency rating and the current Residential Building Mandatory Disclosure (RBMD) landscape in Australia at both the Commonwealth and State/Territory level. The release of a Regulatory Impact Statement (RIS) including an assessment of the costs and benefits of various options for a national scheme provides a measure of likely regulation and practices around house sale and lease transactions. Issues with implementation, the perception of stakeholders and the tools that may be employed are investigated as are wider energy efficiency and sustainability issues to do with the nation’s housing stock and a carbon price impact on housing energy and build costs.

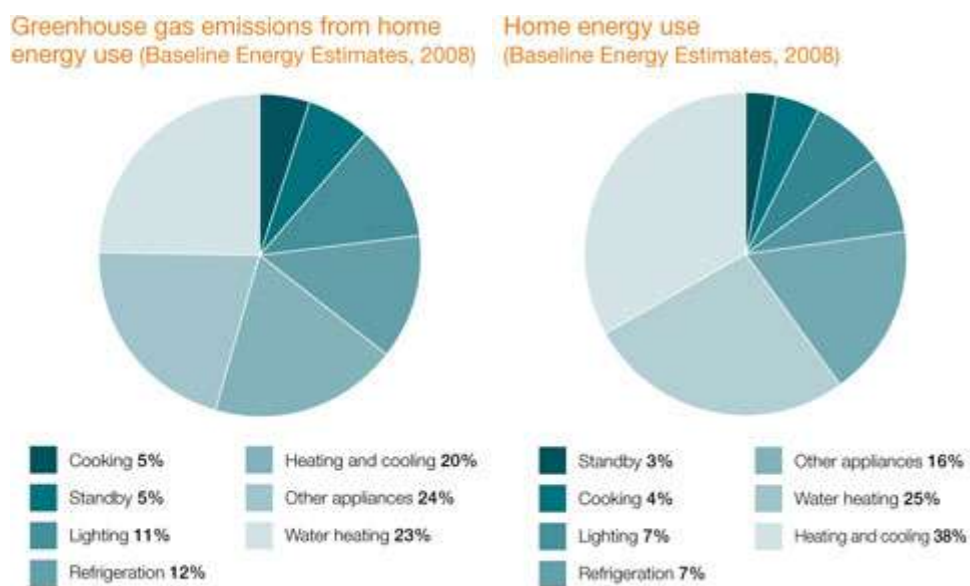
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INTRODUCTION

Approximately 190,000 new dwelling units (ABS 2010) are being built in Australia each year as an addition to the national housing stock, estimated by 2010 at just over 9 million units by the national Housing Supply Council (NHSC 2010). Future net supply increases in the period 2010 to 2029 are estimated at between 2.4 to 3.5 million additional units under various population increase scenarios using both low and high levels of expected population growth. The value to the economy of housing activity is measured by the most recently released quarterly statistics ABS (2011) showing A\$11.5 billion per quarter of national accounts in residential new construction work including alteration and extensions to the existing stock.

Energy consumption attributable to housing occupancy is not only a significant expense for individual households, it is also a significant factor at a national level in overall greenhouse gas contribution and water use. Energy consumed in the home can be broadly categorised as energy used in maintaining a thermally comfortable environment (heating and cooling), energy used in lighting ,energy for heating of water used in household activities, washing , cleaning, and energy (mainly electrical) used for other appliances covering a multitude of household devices such as TVs , security systems and computers. The average Australian household's energy use is responsible for somewhere between eight to ten tonnes of greenhouse emissions every year. The following in Figure 1 shows a breakdown of where energy is used in the average home.

Figure 1 Breakdown of GHG and Energy use in typical Australian houses.



Source: DETI, Government of South Australia, Home Energy Use study: www.dtei.gov.au

The percentage of greenhouse gas emissions from home energy use depends on the carbon intensity of the energy source. For example, the carbon intensity of electricity is much higher than that of natural gas or wood per unit of delivered energy. Therefore, although heating and cooling is the highest energy use in the home, as natural gas is typically used for heating, it is not the highest greenhouse gas emitter. Trends in household energy consumption have been tracked in a major Australian government (DEHWA 2008) longitudinal study 1986 – 2020 indicating increased efficiency of refrigeration equipment , greater penetration of air conditioning in homes and increased demand for both lighting and power for consumer devices such as computers and TV's.

In Australia, the regulation of energy efficiency of buildings is covered by a range of Commonwealth, State and Territory agencies. In April of 2009 specific measures to increase energy efficiency of buildings were set out in a Council of Australian Governments (COAG) communiqué, and specifically for residential class buildings proposing :

- *the phase-in of mandatory disclosure of residential building energy, greenhouse and water performance at the time of sale or lease, commencing with energy efficiency by 2011; and*
- *an increase in energy efficiency requirements for new residential buildings to six stars, or equivalent, nationally in the 2010 update of the Building Code of Australia with full implementation by all states by 2011.*

The latter of the measures outlined above has seen implementations by most states, though with NT and Tasmania currently holding back on their adoption. In Queensland the ‘six star’ measure can be achieved with significant concessions for utilising an outdoor living space as part of the house design.

Research on the cost of such higher mandated building standards has been conducted (Constructive Concepts 2009, Belusko & O’ Leary 2010, CIE 2010) and cost and benefits modelled in studies many of which show marginal economic benefits once star ratings are increased to optimum or more carbon zero levels of 9-10 star homes. In some studies the existing housing stock is presented as a more fruitful area of energy demand reduction, as ratings using the current crop of tools for measuring energy efficiency show existing homes can be well below the new 6 star standard and can be as low as 1 – 2 stars. The Moreland Foundation (2011) in a recent study of older housing in Victoria found the average energy rating of the existing houses was 1.3 stars, indicating just how much less efficient typical existing houses are compared to newly built houses. The sample of houses was small but represented a spread of ages typical of inner city homes built in the period (1900-1980) Some houses had no ceiling insulation, poor window performance and had high level of air infiltration due to inadequate draught proofing and sealing.

Understanding user behaviour and the occupancy profile of any housing unit irrespective of its construction form is fundamental to an assessment of housing energy efficiency. As figure 1 shown earlier implies, the greatest reduction in energy usage can be made by choosing energy efficient water heating and electrical appliances. An appliance with a higher rating might cost a bit more to buy, but can provide savings over the life of the product. As a common sense principle householders seeking energy efficiency should then ensure they are only running appliances in their home that they really need, that they are buying the right sized appliance to meet their needs and turning off appliances at the power point when not in use to prevent the appliance drawing standby power.

HOUSE ENERGY RATING SCHEMES (HERS) AND ENERGY EFFICIENCY

According to Reardon (2005) Rating tools for Australian households that have been developed to fall into two broad types, although some combine both approaches.

- Those that predict performance at the design stage, such as house energy rating tools.
- Those that measure the actual performance of the building, including behaviour and appliances.

This distinction between the two types is important because it defines how the tools can be used. Predictive tools that have standardised user profiles may be used for regulatory purposes by providing a comparison between buildings that assumes similar behaviour patterns. These tools attempt to predict the future performance of new or existing buildings by eliminating the influence of current user behaviour. Current regulation in Australia allows the use of one of three separate software tools to demonstrate compliance with minimum performance for energy efficiency in new housing. The energy rating of new single dwellings can be determined by computer software provided that it complies with the relevant Australian Building Codes Board (ABCB) *Protocol for House Energy Rating Software*.

House Energy Rating Schemes (HERS) in Australia such as the Nationwide House Energy Rating Scheme (NatHERS) have traditionally only assessed the thermal performance of residential buildings. HERS tools calculate the heat energy gains and losses associated with the design of the building in a particular location, and determine how much artificial heating and cooling may be required to maintain human thermal comfort. HERS software accredited under NatHERS can be used to assess compliance with the BCA and other regulations. The rating is a graded adjustment for house size and location as climate influences heating and cooling loads and the size of a house floor area will affect the heat transmission for a given wall area.

Currently available HERS do not include the energy use of appliances or the embodied energy of building materials, although work is underway to broaden Australian HERS tools to cover other energy impacts such as

lighting, hot water, and major fixed appliances. This is work incorporated by CSIRO (2010) in its release of the beyond 2nd generation tool Accurate Sustainability, version 2.0.

NSW uses a variation of Nathers called the Building Sustainability Index (BASIX) which is an online, predictive assessment tool. The designer of a house or unit enters data about the dwelling into the BASIX tool. Requested information includes 'site location, house size, type of building materials, and fittings for hot water, cooling and heating' (NSW Department of Planning, 2006). After analysing this data, the BASIX tool provides a score for the design against its water, thermal and energy performance.

Tools that provide feedback on how people are actually using a given building are more valuable for examining how occupant behaviour might be changed to reduce a building's impact on the environment, but these tools cannot be readily used for regulatory purposes. These tools are particularly useful at tracking improvements to the environmental management of a building. Aspects of building environmental performance that can be rated include:

- Performance of individual appliances and fixtures such as fridges, shower heads, gas heaters etc.
- Performance of individual building elements such as windows.
- Performance of a combination of elements such as the building envelope.
- Performance of a whole building

The design of a home is only one factor in its performance which is also greatly affected by choice of appliances and occupant behaviour. Energy and water efficiency ratings are available for many popular household appliances and equipment and provide guidance to consumers. NABERS HOME at home.nabers.com.au is an easy-to-use tool for comparing the energy and water use of an existing home to that of an average household. This web-based tool is available for anyone to use and the website also provides diagnostic tools, the Energy and Water Explorer, to provide personalised advice. Because it focuses attention on the interaction between the occupants and the building, rather than the technical potential for that building, it can provide a realistic assessment of how a home is actually performing at a particular point in time as used by those occupants.

A NABERS HOME rating analyses 12 months of actual energy or water use, and supplies a rating out of 5 stars, with 2.5 stars representing an average household. A 5 star home is very efficient, while a 1 star home has plenty of opportunities to improve. NABERS is not a predictive tool. It complements, rather than replaces, other rating systems that focus on the design stage, such as HERS. It can only be used for an existing home that has been occupied for 12 months and provides an opportunity to check whether the home is performing as well as it has been designed to perform. The NSW Department of Environment and Climate Change, who are developing and managing the NABERS scheme in agreement with the Australian Government, are also working on waste and transport ratings for homes.

Current disclosure schemes in Australia

The Australian Capital Territory (ACT) first introduced a scheme in 1999 later revised under the Civil Law (Sale of Residential Property) Act 2003. The scheme which seeks disclosure of properties energy efficiency operates independently from the Australia Building code and the ACT state planning and building approvals processes. No mandatory minimum level of an existing house's rated energy efficiency applies such as it does in the adoption by states of the six star standard for new housing. Initially when introduced the star rating scale was a 1 – 6 stars scale due to the use of the first generation assessment NATHERS based software tools outlined in the previous section however since the introduction of 2nd generation thermal assessment modelling it now uses the 1 – 10 star model corresponding to the current NATHERS starbands.

All ACT ratings are under one climate zone, climate zone no. 24 Canberra, ACT. Essentially in the Australian Capital Territory if as a vendor you are about to sell a dwelling you occupy or on that is occupied or rented to tenants, you need to disclose to prospective purchasers the current level of energy performance of the dwelling. Real Estate Agents, vendors and energy assessors will need to ensure that advertised EERs comply with the *Civil Law (Sale of Residential Property) Act* however the direct responsibility is with the vendor for the provision of the EER certificate. Section 20A of the Residential Sales Act authorises the ACT Planning and Land Authority (ACTPLA) to make guidelines for the preparation of EER statements (the Guidelines). Assessors preparing energy efficiency rating statements under the Residential Sales Act must also be registered

with ACTPLA. Registered energy efficiency assessors are subject to a code of practice, as well as the Guidelines, which inform auditing requirements, protocols for assessing building elements and lodging EER certificates with ACTPLA. According to the Construction Occupations (Legislation) Amendment Bill 2010 introduced into the ACT parliament last year there are currently over 200 registered energy assessors.

Once an EER Statement has been obtained, as a vendor you need to:

1. include the EER value in all sales advertising of the property; for example, EER 3
2. provide a copy of the EER Statement to the purchaser
3. ensure that the EER Statement forms part of the contract for sale.

The Queensland government in 2010 introduced a somewhat more holistic however less technically rigorous 'sustainability declaration' method of disclosing information on a properties energy systems. The sustainability declaration is a compulsory checklist that must be completed by the seller (vendor) when selling a house, townhouse or unit. The checklist is designed to identify the property's environmental and social sustainability features in these key areas: energy, water, safety and access. The declaration is designed to be completed by the property owner or a delegated individual. If an owner is unable to complete the form, they can seek help from another person to complete it on their behalf as long as the owner signs it. A copy of the completed sustainability declaration must also be conspicuously displayed whenever a home is open for inspection by the seller, such as an open house as it is the responsibility of the agent to disclose where a declaration can be obtained.

Research by Bryant & Eves, (2011) in a survey of real estate agents showed that whilst a high level of compliance with the provision of declaration existed there was widespread disengagement with the sustainability declaration process from both sellers and buyers. In fact the survey they undertook indicated that a massive 98% of buyers do not ask for a copy of the sustainability declaration at any time during the sales process. In Queensland a secondary market now exists in online 'sustainability declaration' providers who for a fee as low as \$100 will help the owner generate the necessary declaration based on self-assessment of their properties features in the 4 key areas.

In South Australia no mandatory disclosure scheme currently exists for sales of existing homes however as part of the requirements to show vendor information under the relevant legislation as direct by the SA Office of Consumer Affairs (2010) the following question is required to be addressed in some fashion; "*How energy efficient is the home, including appliances and lighting? What energy sources (e.g. electricity, gas) are available*" This is part of the Form R3 the standard form for statutory disclosures used in real estate transactions in South Australia.

The role of billing data has been investigated in South Australia in a report by Sustainable Focus (2010) commissioned for the government in anticipation of adoption of a RBMD scheme. The report proposes that billing data be used as a check against whatever tool(s) are selected to determine household energy performance. In the opinion of the report's authors the question of a role for energy billing data in Mandatory Disclosure appears to be missing from the current national debate or proposed models of RBMD. In their view it is critical that information be provided that is useful to the new owner/lessee and/or the vendor/lessor. This information will be useful if it can enable the comparison of different dwellings likely energy performance and provide practical guidance on how to improve energy performance. The information must also be usable by real estate agents, so it should highlight both good and bad features, and possibly flag options for improvement that might be feasible in the sale process.

A review of ABS analysis of billing data in SA since 1990 indicates that quite a wealth of information can be obtained on baseline residential energy use from bills; including average annual energy use per appliance and % breakdown of energy by end-use. This information can be provided as a function of household occupancy, area, income etc. Initial discussions with the ABS indicate the possibility of identifying how to quantify behaviour in regression analysis and it is recommended that this type of analysis be followed up in future. The research could be quite innovative and possibly ground breaking.

One option is the use of billing data as part of a first tier of mandatory disclosure. Under this option all households affected by mandatory disclosure begin by filling in an on-line self-assessment. This assessment could be one of the numerous tools under development (possibly simplified) and would ask for access to electricity and gas billing data to be authorised. The expected energy consumption from the on-line assessment

could then be compared with the actual energy consumption from billing data. If these two values are within an acceptable tolerance then the online assessment can be used to determine an overall performance rating. If the two values are quite different or billing data is not available this could trigger an on-site assessment. While the headline rating should be based on greenhouse emissions separate electricity and gas energy values should be used throughout the model and converted to greenhouse emissions at the final stage.

THE PROPOSED NEW NATIONAL MODEL RESIDENTIAL MANDATORY DISCLOSURE SCHEME

Introduction to the proposals for RMBD

July 2011 saw the release of a consultation Regulation Impact Statement (RIS) for mandatory disclosure of residential building energy, greenhouse and water performance with a following consultation period for industry stakeholders, groups and individuals to comment on proposals. The latter half of 2011 has marked the stage in the policy development process initiated by the COAG declaration of 2009 whereby measures or various options to disclosure energy efficiency of existing dwellings are both tested for regulatory implementation, consumer and market acceptance as well as national and state level cost benefit analyses.

The options (Allen Group 2011) proposed are broadly classified as;

- regulatory options (choice of options, nos 1 -4)
- non-regulatory options (option 5)
- assessment opt-out (option 6)
- base case – maintain current approach

The proposed options would apply to the sale and/or lease of all types of residential buildings (separate houses, semi-detached houses, flats, units and apartments), with the possible exception of housing associated with shops and offices, mobile homes, hospices and aged care accommodation as well as social and remote housing.

The preliminary findings based on information that is to hand at present indicates that there are regulatory and non-regulatory options for intervention where the community would be better off with intervention than without it. That is, there are a number of options where on the basis of the modelling undertaken the benefits exceed the costs. The question of costs and benefits is contested. Residential Building Mandatory Disclosure is characterised by a mandated aspect, which drives the costs, and a voluntary aspect, which drives the benefits. Given this fact, the estimated costs are fairly certain, whereas estimated benefits are inherently uncertain. In particular, the benefits are largely driven by the assumed voluntary investment response (or uptake rate). There is not enough information to measure the level of uncertainty around the assumed uptake rate, but it is likely to be large.

The impact of the Australian Government's Home Insulation Program (HIP) is a further source of uncertainty. It is difficult at this time to determine precisely how many additional residential buildings were in fact insulated. Sensitivity analysis performed and reported in this consultation RIS document suggests that if an additional 1.2 million residential buildings were insulated under the HIP (which may be an overstatement of the additional buildings that were insulated), the net present value of all of the options assessed would be lower than the central case results suggest. The sensitivity analysis indicates that Options 2, 3, 4 and 5 still have a positive net present value with the HIP included.

Discussion of proposed options - some pros and cons

Options 1 and 2: Full thermal efficiency assessment requires adequate and accurate knowledge of the thermal mass, insulation levels and zoning of a dwelling and this in turn is reliant on adequate and accurate knowledge of the construction materials and any thermal barriers or insulation within the wall structure. Such a high level of assessment as proposed in option 1 is arguably only feasible and cost-effective in newer homes for which current, accurately drawn floor plans exist. Option 2 provides a more simplified assessment of the thermal performance of the building shell and less detailed analysis of the components (appliances) related to energy

efficiency and due to its much lower cost is modelled as the most desirable from a cost/benefit standpoint. Not a great amount of detail is provided as to what real level of assessment is required for both the building and its components however some have pointed to the type of assessment carried out under the now defunct Commonwealth government green loans scheme. It must be noted that, for *most existing* housing plans either no longer exist, are not held by the current home-owner, and in the case of Councils and other regulatory authorities, have often be lost or at best archived and are thus not readily accessible so the question of whether house plans are needed is a clear ‘game changer’ in the scenarios of option 1 versus 2.

Options 3 and 4: These options use a Self- assessment method to achieve the desired outcomes. Whether Home owners will either not perform any such assessment accurately – for the same reasons of perception of potential loss as are applicable to lessees and real estate agents, or they will simply get it wrong is a key question surrounding these options. Human nature being what it is, vendors have a vested interest in not spending any money on a property they intend to sell. Additionally, they have any incentive to highlight potentially price-sensitive failings of their property. For that reason, there is an argument that the provision of assessments must not be performed by vendors, lessees or real estate agents as all have a vested interest in minimising the true situation. This would be akin to allowing vendors to provide ‘building construction’ examinations, or ‘pest examinations’ such as those currently required by most lending authorities and which are paid for by purchasers.

Option 5 is a non-regulatory option, which addresses the government’s objective to tackle the market failure associated with a lack of information through a public education program and publicity campaign. Under this option of voluntary uptake through public education and publicity campaigns government would conduct a public education program and publicity campaign to increase awareness of the importance of improving the energy, greenhouse and water performance for residential buildings, and the opportunities that home owners, tenants and landlords have to improve the performance of buildings. This option could adopt a voluntary checklist approach similar to that outlined in Option 4. Option 5 appears designed to some extent, take advantage of the existing trained assessors such as Green Loans and for Professional development of real estate agents under this public information approach would be of significantly less magnitude than options 1 to 4.

Option 6, the ‘opt-out’ approach would appear to still require agents to receive training on the regime in order to fully inform clients of their obligations and opt-out choice. Those not wishing to have a zero rating – potentially the majority - would still need to be taken through the disclosure reporting documentation so the professional development impact would not differ greatly from options 3 and 4.

It is beyond the scope of this paper to provide a more detailed analysis of each individual option or examination of the RIS modelling of costs and benefits, however attached to this paper (Appendix 1) is a consideration of some of the perceived advantages and disadvantages in the response to the impact study by the Association of Building Sustainability Assessors (ABSA) arguably the national body most qualified to discuss methods of home energy assessment and disclosure of such.

Residential Mandatory Disclosure --- problem identification and likely responses

The RMBD regulatory impact study does state that “*the market for residential buildings suffers from information problems*”. Specifically, there is a “*market failure*” in the housing market leading to “*information asymmetry (unevenness)*” with the following undesirable outcomes being observed today:

- It is difficult to distinguish between high and low quality buildings (in relation to energy, water and greenhouse performance) at the time of purchase/lease
- Adverse selection (the market for lemons)
- High quality products driven out of the market

ABSA (2011a) in its publically available submission referred to above agrees that the problem of building inefficiency is created by information asymmetry and missing information, however, they believe that in addition to these two issues, “that the problem is further complicated because the market doesn’t *value* the information, nor *understand what to do* with such information”. ABSA believes that “*you can’t manage what you can’t measure*” and results from surveys such that commissioned by the Clean Energy Council (2011)

clearly indicate that the problem is more complex than information asymmetry: Australians it seems, want to take action, and are prevented from doing so by lack of information and support through the change process. While 95 per cent of people surveyed said they were concerned by rising energy costs and 89 per cent said they were willing to take action to use less energy, half knew little or nothing at all about the key aspects of their energy use. 73 per cent of respondents said they would welcome more information on how they could use less energy or use it more efficiently.

ABSA favours options 1 and 2 and contends that a good rating scheme should encourage innovation by providing flexible compliance paths and not be overly prescriptive. Also that it should have the capacity to benchmark higher performance and be able to measure both minimum mandated and better performance. It should integrate the use of current rating tools and allow more impact categories to be added as housing and its impact on the environment become more understood for instance the question of embodied energy. The Residential Development Council (2011) in its submission to the RIS consultation suggests that the implementation of a mandatory disclosure scheme will have a long term impact and as such it is important to get the policy right. The residential Development Council believes any scheme requiring mandatory disclosure of energy, greenhouse and water performance should:

- *include a **public education program** and publicity campaign to **increase consumer awareness** about the importance of improving the environmental performance of all residential buildings (existing and new);*
- *develop and adopt a **single national rating tool** (or similar) for residential assessment for new and existing residential dwellings;*
- *secure the **national implementation of a single scheme** with a consistent method of assessment and measurement;*
- ***end consumer confusion** and 'star overload' in the residential sector, especially regarding energy efficiency;*
- ***enable comparisons** of energy, greenhouse and water performance across all residential homes on a like-for-like basis; and*
- ***Establish a national database** for the collection of information from the mandatory disclosure scheme, to provide a better understanding of the performance of the new and existing housing stock nationally.*

Assessor training and the Real Estate Industry

ABSA (2011b) estimates there are over 2000 assessors trained in “2nd Generation” software. And that numbers are reasonably well spread across Australia, particularly in NSW, Vic, Qld and WA but are concentrated in capital cities. Wide geographical spread is not essential as assessors receive most plans electronically and can work from anywhere. Numbers are well distributed across the three software packages available under the National Software Protocol: AccuRate, FirstRate and BERSPro.

Green Gurus (2011) maintain without doubt, real estate agents and property managers are the front line in the housing sector when people are choosing to buy or rent a home and are the missing link so far in optimising the flow of information on energy and water efficient homes. They conducted a study in WA where participating agents confirmed that marketing strategies which highlight the benefits of sustainability concepts, products and their services will be paramount to increasing demand for sustainability advice. The study found that informed real estate professionals are able to identify cost savings including subsidies available for the properties they manage/sell and communicate these to their client. They have also started to include sustainability information in their marketing material to promote the green credentials of the properties they are selling. And most remarkably, some agents are simply providing action based information such as ‘*top 10 ways to reduce energy use*’ and ‘*Energy Action Plans*’ to the greater community.

Social housing

The RBMD consultation RIS envisages that social housing would be treated somewhat differently to other residential property types under a mandatory disclosure scheme however it does not specifically identify how the treatment of social housing would differ, recommending that this should be a matter for separate analysis.

Tenants in social housing, as in the market generally, are responsible for paying ongoing energy and water bills and it is envisaged that residential mandatory disclosure can provide information to tenants to foster investment in energy efficiency measures following occupation of the building. Because they are not the owners of the property (either the building envelope or the major fixed appliances), and because they tend to have lower than average incomes, there may be little capacity for such investment by social housing tenants

One of the objectives of mandatory disclosure at the time of lease is to inform and influence people's choices in the buildings they rent and/or the rents they will pay. However, the ability of social housing tenants to choose between accommodation options is constrained and rental rates are usually determined based on incomes. In the case of social housing, the building owners are government and not-for-profit organisations which have less scope than private providers to recover efficiency investment costs. Alternatively, it could be argued that it is particularly important to provide efficiency information to low income tenants because of their vulnerability to rising energy and water costs. Information could be provided in a disclosure certificate on specific low-cost ways to reduce energy and water bills, such as installing water efficient showerheads, draught preventers, efficient lighting, or setting air conditioner set points to run more efficiently.

Most states and territories have consumer awareness and energy efficiency programs linked to grants and rebates for such things as replacement of energy inefficient light globes, installation of draught proofing and insulation as well as water conservation devices such as low flow shower heads and rain water tanks.

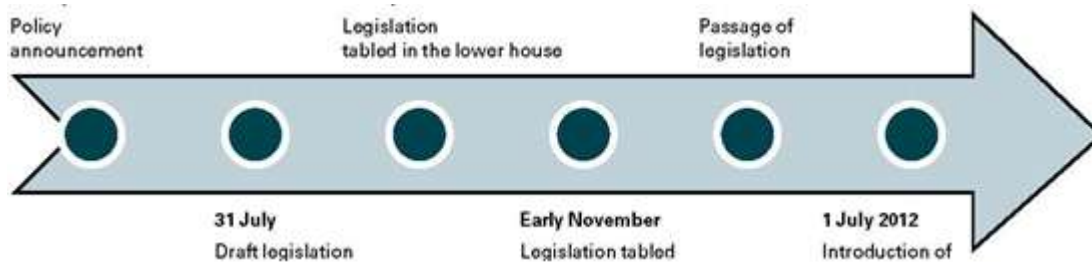
The impact of a Carbon Price

The most significant impact of a carbon price for the real estate and construction sectors is the indirect cost increase in energy and cost pass-through in the supply chain from materials. These increased costs and their drivers, are detailed in a report by KPMG (2011) as the below.

- *Electricity and gas prices will increase as a result of the price on carbon. - Electricity is forecast to increase by at least 60 percent by 2020, excluding the creep created by CPI. The current \$42 per MWh looks cheap in treasury modelling compared to a potential \$194 per MWh in 2050.*
- *Fuel will be affected by the price of carbon. - The net cost of off-road fuel will immediately reflect a shadow carbon price. This will affect users of fuel for power generation from diesel used on construction sites and standby generators. - Fuel used for on-road heavy vehicles may be in scope after 1 July 2014.*
- *Building material costs will all be impacted but by varying degrees. - Glass, aluminium, steel and cement manufacturing are emissions intensive sectors and hence they are likely to be liable entities. While these sectors are eligible for compensation under the targeted assistance programs (Jobs and Competitiveness Program), they will still incur carbon-related costs and are not obliged to pass on the compensation. - Not all building materials will receive compensation, such as brick manufacturing and plasterboard. Manufacturers of these materials are therefore more likely to pass through the full cost of the carbon price to customers.*
- *Waste disposal costs will increase significantly as landfill sites are within the scope of the carbon price mechanism.*

The RBMD RIS makes assumptions based on a no carbon price environment in the first part of the cost/benefit analysis while using an indicative carbon price to estimate greenhouse gas emissions reduction as a costed benefit (p.39). As the passage of this legislation goes through both houses of federal parliament and the time frame outlined in Figure 2 below with a carbon price between \$23 - \$25, in the first years of its introduction its impacts on household energy prices and ability to improve the energy efficiency of homes remains unclear.

Figure 2 Timeframes of Carbon Price Mechanism Introduction



Source: KMPG 2011 *The Impact of A Carbon Price – Property and Construction*

CONCLUSION

Residential Mandatory Disclosure is a federal government initiative but is likely to be implemented in different ways across the states and territories either as some states choose to possibly extend their existing schemes e.g.. Act and Queensland or others develop hybrid schemes based on other factors, for example SA's approach to use billing data. Billing data does not appear to be part of the options outlined in the RBMD RIS study however there is a case that as using billing data is certainly no more flawed than any other approach which will require assumptions regarding performance.

The impact of the growing cost of energy on household budgets is now becoming increasingly uppermost in the minds of householders as energy costs are rise and are predicted to rise further with a carbon price mechanism. Some studies suggest however a degree of consumer ignorance of what to do and more specifically in relation to declarations of energy efficiency are time of sale of property a low prioritisation as to accessing or understanding the information on any declaration or disclosure document.

In respect to this federal government initiative on housing energy efficiency, there has been increased debate and opinion by industry stakeholders on the merits of the initiative, both in terms of principles and practicalities. Whatever model is developed for residential building mandatory disclosure, it appears likely it will need to report on both the fabric of the building as well as the appliances (especially heating/cooling), as this data will influence the veracity and usefulness of the final assessment report. There is not a great deal evident in either the regulation impact study or policy development processes of much in the way of learning from overseas models of mandatory disclosure. Mandatory disclosure tools that exist for new housing and regulation of standards for new housing exist both nationally and internationally however how they might be adapted for rating existing housing stock or whether it is fact desirable to use such existing tools and what the benefits are to their use is still ill-defined.

Residential Energy Efficiency Mandatory Disclosure at point of sale and lease appears achievable across Australian jurisdictions with the likely benefits of;

- Improving community wellbeing and environmental sustainability and reducing potential greenhouse emissions
- Addressing information shortfalls (asymmetries) and significantly reducing the incidences of adverse selection by requiring all sellers and landlords to disclose a mandatory rating that will inform buyers of the energy and carbon efficiency of buildings at the time of sale/lease
- Promoting efficient investment to make dwellings more sustainable

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APPENDIX 1 ABSA SUBMISSION TO RBMD RIS; COMMENTS ON OPTIONS 1 -5

Source : *Regulatory Impact Statement (RIS)* submission by Association of Building Sustainability Assessors September 2011

Option	Advantages	Disadvantages
1. Full Thermal Assessment	<ul style="list-style-type: none"> • Site-specific • Most accurate • Based on NatHERS thermal performance • Requires homeowner to engage with assessor which enables the transfer of information • Recommendations tailored to homeowners specific needs 	<ul style="list-style-type: none"> • Requires full house plans and/or significant assumptions that increases the costs and may reduce effectiveness of recommendations • May create additional confusion for homeowners and the marketplace about NatHERS and the difference between NatHERS and RBMD
2. Simplified Thermal Assessment	<ul style="list-style-type: none"> • Site-specific • Focuses on the 'built-in' capacity of a house to achieve sustainability outcomes, rather than the 'bolted-on' features such as water tanks etc • Currently more cost effective than option 1 • Good transition option to facilitate long-term adoption of option 1 • Requires homeowner to engage with assessor which enables the transfer of information • Recommendations tailored to homeowners specific needs 	<ul style="list-style-type: none"> • Less accurate (than option 1) • Requires a number of assumptions that reduces the site-specific accuracy, and which can cause confusion
3. Online self assessment	<ul style="list-style-type: none"> • Easy to create and track data • Contains a minimum judgment of thermal performance 	<ul style="list-style-type: none"> • Does not require an assessor which can lead to errors and requires the assessment to be overly simplistic and/or rely on large assumptions • Does not provide homeowners with new and tailored knowledge about their property • Almost impossible to provide quality assurance • Will tend to focus consumers on 'bolted-on' features such as water tanks, rather than those aspects which are 'built-in' and reduce consumption
4. Self assessment checklist	<ul style="list-style-type: none"> • Identifies the houses which have easy to understand sustainability features (ie water tanks, solar hot water, PVs) 	<ul style="list-style-type: none"> • Does not provide a comparable rating • Does not consider 'built-in' features of thermal performance that reduce consumption • Does not require an assessor which can lead to errors and requires the assessment to be overly simplistic and/or rely on large assumptions • Does not provide homeowners with new and tailored knowledge about their property • Impossible to provide quality assurance • Anecdotal evidence (from QLD Sustainability Declaration) indicates people prefer not to indicate the presence of features
5. Public education campaign	<ul style="list-style-type: none"> • Can articulate one message clearly (ie, black balloons) 	<ul style="list-style-type: none"> • Cannot provide site specific information • Does not provide nationally consistent and comparable data • No guarantee that message is heard or that action is taken

APPENDIX 2 Source: Allen Consulting group RBMD Regulation Impact Study 2011

COMPARISON OF REGULATORY OPTIONS

	Option 1 (Full thermal assessment)	Option 2 (Simplified thermal assessment)	Option 3 (Self assessment online tool)	Option 4 (Self assessment checklist)
Assessment method	Full thermal performance simulation + other building component information	Simplified thermal performance assessment + other building component information	Simple online thermal performance assessment + other building component information	Checklist of building component information
Drawings required?	Full floor plan drawing required ^f	No	No	No
Data collection requirement	High complexity & high volume ^g	Mid complexity & mid volume ^h	Low complexity	Limited
Compliance approach	Mandatory	Mandatory	Mandatory	Mandatory
Rating provided?	Yes	Yes	Yes	No
Rating type	Quantitative	Quantitative	Quantitative	Binary (present or not present)
Assessor requirements	Approved assessor	Approved assessor	Unskilled (non trained) e.g. householder or agent	Unskilled (non trained) e.g. householder or agent
Registration required?	Certificate lodgement required	Certificate lodgement required	Certificate lodgement required	No
Assessment cost^a	\$774 – Assessor ^b \$50 – Householder waiting cost ^c	\$172.50 – Assessor ^b \$25 – Householder waiting cost ^c	\$68 – Self-assess ^d \$165 – Assessor ^{b,e} \$18 – Householder waiting cost ^e	\$41 – Self-assess ^d \$150 – Assessor ^{b,e} \$14 – Householder waiting cost ^e
Level of information provided	<ul style="list-style-type: none"> • Comprehensive assessment of a building's thermal performance. • High level of accuracy about thermal performance of a building's components. • Ratings for the various components of the overall building performance. 	<ul style="list-style-type: none"> • Simplified assessment of a building's thermal performance. • Mid level of accuracy about thermal performance of a building's components. • Ratings for the various components of the overall building performance. 	<ul style="list-style-type: none"> • Low level of accuracy about thermal performance of a building's components. • Ratings for the various components of the overall building performance. 	<ul style="list-style-type: none"> • Information about the various components of the overall performance provided in a checklist format without a rating.

Notes: a) reflects the cost of a house assessment in an urban area in Victoria. Costs of assessments in non-urban areas are assumed to be higher and costs of assessments on apartments are assumed to be lower. Costs in other jurisdictions vary according to relative average weekly earnings. b) excludes certificate lodgement fee; c) assumes householders will need to be present whilst house is being assessed; d) cost to householder in undertaking the assessment by themselves (based on the cost of their time); e) if householder decides to outsource the assessment to an assessor. Additional details about the methodology and assumptions used to derive these costs are provided in Appendix B and Appendix C. f) Assumes that a floor plan is required to import into the software. Full working drawings (plans and elevations) are not assumed. g) Assumes no house data or plans available, all data collected manually on site and limited software default values for existing properties. h) assumes basic measurements are taken and collected manually on site
Source: Provided by NFFF RIC.