National Framework for Energy Efficiency

Mandatory Disclosure of Commercial Building Energy Efficiency

CONCEPT REPORT

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This concept report was prepared by the Department of the Environment, Water, Heritage and the Arts on behalf of the government jurisdictions and key stakeholders party to the National Framework for Energy Efficiency.

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PREFACE

This concept report has been prepared to examine a national regime for the mandatory disclosure of commercial building energy efficiency. This initiative was identified in Stage One of the National Framework for Energy Efficiency (NFEE).

The report focuses on the issues associated with the development and implementation of a national regime for the mandatory disclosure of commercial building energy efficiency. This includes examination of key technical, administrative and legal issues in the context of the commercial property sector.

Preliminary economic analysis of a national mandatory disclosure regime is also included in the report. More detailed economic analysis is likely to be required as part of the next stage of this work.

This report complements a previous Issues Paper prepared by Bassett Applied Research (2007) and was written before the Kyoto Protocol came into force. However, the ratification is unlikely to have a profound impact on this report.

Direct contributions to the content of this report were sourced from Access Economics, Australian Government Solicitor, and Bassett Applied Research (in association with Syneca Consulting, Sparke Helmore and CBSE). Initial consultation with industry and state and territory stakeholders has also been undertaken and a summary of their comments is in Appendix G.

SUMMARY

KEY FINDINGS

1. Office buildings are responsible for the most significant proportion of energy consumption and greenhouse gas emissions for the commercial building sector. Office buildings should, therefore, be the priority of any mandatory disclosure regime.

2. Given the different ownership and tenancy arrangements of commercial properties, a mandatory disclosure regime needs to enable the rating of whole buildings, base buildings and tenancies. Furthermore, disclosure should occur at both the point of sale and lease of commercial buildings in order to maximise the opportunities for disclosure to occur.

3. The rating of commercial buildings needs to be presented in a relatively straightforward and meaningful manner to enable a simple comparison of buildings on a 'like-with-like' basis. To be fully effective, the information disclosed should also identify impediments and opportunities for improving the energy efficiency of the building.

4. The ABGR scheme provides an established framework for rating office buildings throughout Australia. It enables the rating of existing buildings and provides a methodology for predicting the energy efficiency of new buildings. The ABGR scheme is supported by a rigorous training, accreditation and auditing program. In theory, the ABGR scheme could also be extended to cover other types of commercial buildings.

5. A methodology for establishing a mandatory disclosure scheme for all types of commercial buildings is detailed in Appendices B, C and D. This methodology could be used as an alternative to, or possibly in conjunction with, the ABGR scheme, Green Star or another rating methodology. It is acknowledged that any methodology would need to be specifically enhanced for these purposes.

6. The training, accreditation and auditing of assessors is essential to ensure that ratings are consistent and accurate.

7. Adequate energy metering of buildings is essential to the operation of a mandatory disclosure regime. Energy data is necessary for establishing benchmarks for different building types and for ratings to be carried out on the actual performance of buildings. There is a potential privacy issue regarding information about energy used by tenants. This issue needs to be further assessed in the regulation impact assessment.

8. A mandatory disclosure regime must be underpinned by an administrative framework that supports the technical processes. Ideally, for consistency and uniformity, this function should exist in one national administrative body responsible for the implementation and ongoing development of the regime.

9. There are a few overseas examples of mandatory disclosure regimes for commercial buildings. A relatively detailed mandatory disclosure scheme for commercial buildings has been developed in the UK. This scheme is due for staged implementation over the next three years. Examination of the UK scheme and its effectiveness, once implemented, could be useful in the development of an Australian scheme.

10. Legislation for the mandatory disclosure of commercial building energy efficiency could be enacted by the Commonwealth or by the States and Territories. However, a single federal scheme enacted under Commonwealth legislation provides the simplest opportunity for a nationally consistent scheme. Enforcement mechanisms could be modelled in a number of different ways.

11. The market for commercial buildings greater than 2000 m^2 is made up of sophisticated investors who are generally aware of the costs implied in building operations and have the means to conduct energy efficiency investigations. Aside from the externalities caused by greenhouse gas emissions, the main market failures in this sector seem to be based on information issues such as a lack of awareness about privately cost-effective energy saving measures. An emissions trading scheme will add impetus to energy efficiency improvement to commercial buildings. However, preliminary calculations indicate that this will only slightly increase building operating expenses.

12. Data limitations and the heterogeneity of commercial buildings have prevented this study from reaching any firm conclusions about the effectiveness of mandatory disclosure. In light of this and the issues raised above, priority should be given to having a detailed regulatory impact assessment undertaken into the effectiveness of mandatory disclosure in achieving meaningful increases in commercial building energy efficiency. The study should be undertaken in accordance with the requirements of the Office of Best Practice Regulation and precede any further work on this policy.

13. Additionally, a pilot study could be undertaken to test the hypotheses of the economic analysis. A pilot study would clarify the issues that need to be overcome in order to implement an effective national mandatory disclosure regime for commercial buildings.

BACKGROUND

The establishment of a national regime for the mandatory disclosure of commercial building energy efficiency was identified in the 2004 Energy White Paper, *Securing Australia's Energy Future*. It was subsequently adopted by the Ministerial Council on Energy (MCE) in the implementation plans for Stage One of NFEE.

Under NFEE Stage One, the stated objective of mandatory disclosure is to ensure that credible and meaningful information on the energy efficiency of commercial buildings is readily available to potential purchasers and lessees. This is to provide potential purchasers and lessees with the means to compare the energy efficiency of buildings on a 'like-with-like' basis.

To achieve this, NFEE Stage One identified the need to reach agreement on the metrics and tools used to measure the energy efficiency of commercial buildings, the need to enact appropriate legislation, and the need to establish an administrative framework to oversee the scheme in each jurisdiction.

Mandatory disclosure is intended to compliment the energy efficiency provisions in the Building Code of Australia (BCA). The BCA contains minimum technical requirements that are applicable to new building work. Mandatory disclosure, on the other hand, is intended to stimulate energy efficiency improvement in the large proportion of existing buildings that are not captured by the BCA.

Building activity is a significant component of the Australian economy, accounting for approximately 9.3% of Gross Domestic Product. Approximately one quarter of building expenditure is on commercial buildings. The overall value of Australia's commercial building stock has been estimated to be around $575 billion. It is also estimated that approximated 75% of investment is used for building maintenance and upgrades rather than on the construction of new stock.

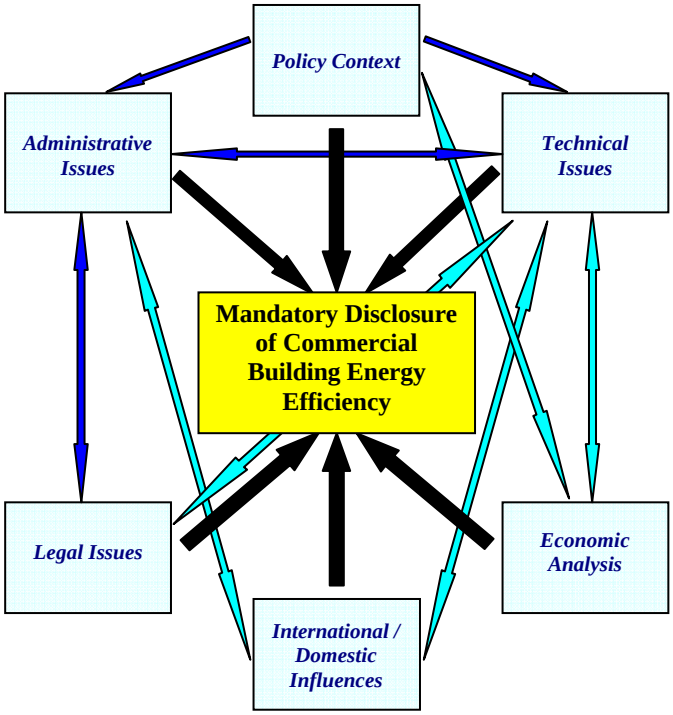
In terms of greenhouse gas emissions, commercial buildings are responsible for approximately 10% of Australia's total emissions. Office buildings contribute the most significant proportion of emissions for the commercial building sector at approximately 27%. Hospitals are the second largest emitters at 13%. In terms of energy uses, space cooling, ventilation and lighting contribute approximately 71% of the total emissions from the sector.

There are many factors that can influence the value of a commercial building. Energy efficiency is just one consideration in addition to location, services provided, amenity, value and terms of leases, and operational costs. Disclosure of commercial building energy efficiency enables potential purchasers and lessees to exercise consumer preference on this issue, in addition to those other building attributes that are disclosed at the point of purchase or lease. The level of energy efficiency will influence consideration of the buildings energy consumption, expenditure on maintenance and the replacement of building elements, amenity and internal comfort conditions. From an environmental perspective, it will influence consideration of the greenhouse impact of the building. From an investment perspective, it will influence consideration of long-term financial benefit and exposure to energy conscious markets.

An Issues Paper was prepared, in consultation with a broad range of stakeholders, as a precursor to this report. The paper highlighted the following fundamental outcomes to be addressed by a national regime for the mandatory disclosure of commercial building energy efficiency:

- The regime needs to be simple, cost-effective and consistent across all jurisdictions.
- The regime must enable the assessment of both new and existing commercial buildings and disclose the energy efficiency of buildings in a manner that is meaningful and easily understood.
- Adequate metering of buildings is essential for energy data collection and must be supported by comprehensive data management processes.
- A robust training and quality assurance scheme is necessary to ensure the competence of assessors and the accuracy of ratings.
- The regime must be supported by an industry education strategy and facilitate feedback and the review of processes.

The research and analysis underpinning this report has highlighted the complexity of commercial building mandatory disclosure. For simplicity, issues have been grouped in this report according to technical, administrative, international, legal and economic; and have been presented linearly. However, this belies the complex interrelationship between issues. The figure below attempts, in part, to demonstrate the multi-factorial nature of the development and implementation of a national mandatory disclosure regime for commercial building energy efficiency.



TECHNICAL AND ADMINSTRATIVE

Fundamentally, a disclosure regime requires a means of measuring, or rating, the energy efficiency of commercial buildings so that potential purchasers and lessees can compare buildings on a 'like-with-like' basis. For this to occur, there are a number of technical and administrative issues that need to be addressed.

Buildings of a similar nature need to be grouped together under the scheme. The BCA contains a ready-to-use system for classifying buildings. This system is already in use in the commercial building sector and is familiar to practitioners. This system also has rules for dealing with mixed-use buildings and the flexibility to allow the use of sub-classifications for more specific building groups.

The varying occupancy and operational arrangements for commercial buildings add another layer of complexity to rating their energy efficiency. In particular, commercial buildings often contain multiple tenants and varying lease agreements. To facilitate disclosure under these different scenarios, the disclosure regime needs to enable the rating of whole buildings, base buildings and tenancies.

The amount of energy consumed by commercial buildings, and how efficiently that energy is used, is contingent upon many factors. The fabric and services inherent in the building will affect the energy use as will the operation of the building and the behaviour of the occupants. These factors relate to the design, construction and fit out of the building, as well as the building operation and management.

In addition to enabling a comparison of 'like-with-like', an effective disclosure regime needs to provide adequate information to enable the identification of the impediments, and opportunities, to achieving a high level of energy efficiency. In turn, this will facilitate a more informed determination of the effect of the buildings energy efficiency upon its value.

Furthermore, in order for the rating to be meaningful and reasonably simple, consideration needs to be given to the metric used to describe the level of energy efficiency. Star ratings are commonly used because they enable normalisation to be carried out, such as to account for climatic differences, without undermining the credibility of the information presented. In turn, this facilitates a 'like-with-like' comparison of buildings that are subject to different conditions.

The energy efficiency of commercial buildings can be assessed using a number of different methods. The most common and accurate methods involve the use of software to rate the energy efficiency on the basis of actual energy consumption data or by modelling the predicted energy use of the building.

The Australian Building Greenhouse Rating (ABGR) scheme is based on a software tool that uses actual energy consumption data to rate the energy efficiency (in terms of greenhouse performance) of office buildings on a scale of one to five stars. The scheme rates the energy efficiency of office buildings by taking into account a number of factors including the amount and source of energy used, the size of the building, hours of use, equipment density and climate. The ABGR scheme can be used to rate a tenancy, base building or whole office building. The theoretical energy efficiency of new buildings can also be predicted under the ABGR scheme. However, this assessment does not qualify the building for an official star rating under the scheme.

The ABGR scheme has been developed by the NSW Government and is currently administered nationally by the NSW Department of Environment and Climate Change. While currently the ABGR scheme can only be used to rate office buildings, in theory, the scheme could be extended to cover other types of commercial buildings. However, the timeframe for this to occur would be largely contingent upon the availability of resources and energy data for the selected building types.

As an alternative to the ABGR scheme, a proposed methodology for the establishment of a disclosure scheme is detailed in Appendices B, C and D. This methodology has been designed to facilitate the development of assessment tools and energy efficiency benchmarks for all commercial building types. The scheme caters for either basic or detailed disclosure of the energy efficiency of buildings depending upon the availability of energy data across the sector of a particular building type.

Assessment of the energy efficiency of commercial buildings is relatively complex. Suitably trained and qualified assessors are therefore essential to ensuring that ratings are consistent and accurate. Training in the use of energy analysis software is currently available through software suppliers and industry associations, such as the Australian Institute of Refrigeration Air Conditioning and Heating. The ABGR scheme is also underpinned by a rigorous training and accreditation process for assessors.

Accurate assessment of the actual energy efficiency of commercial buildings is also contingent upon the availability of energy consumption data and associated information of relevance to the building being assessed. This, in turn, is dependent upon whether there is sufficient metering within the building. With recent advances in computer technology, energy data meters have become increasingly sophisticated, while also becoming less expensive and easier to install. Meters can now be relatively easily installed within both new and existing buildings.

To be fully effective, a mandatory disclosure regime must be underpinned by an administrative framework that supports the technical processes. In this regard, an administrative body needs to be established to oversee the implementation and ongoing development of the regime. In broad terms, the administrative body would be responsible for maintaining the credibility and long term viability of the regime. Ideally, for consistency and uniformity, this function would exist in one national body, although it could be undertaken within each jurisdiction.

The key functions of the administrative body are likely to include the following:

a) Management of the energy data collection and validation processes.
b) Development and review of assessment tools and energy efficiency benchmarks.
c) Training and accreditation of assessors.
d) Maintaining a register of accredited assessors.
e) Implementing auditing and quality assurance processes.
f) Providing for stakeholder communication and feedback.
g) Undertaking regular reviews of the scheme.

INTERNATIONAL

Internationally, there is a variety of approaches to improving the energy efficiency of commercial buildings. The common theme among the jurisdictions is that government incentives for refurbishments and upgrades are favoured.

Some form of energy efficiency disclosure exists in most jurisdictions because energy efficiency information is required to receive incentives. However, few jurisdictions have implemented mandatory disclosure for commercial buildings.

The UK has a well defined mandatory disclosure scheme that is based on EU's certification scheme called EPLabel. The scheme is due for a staged implementation over the next three years. For most commercial buildings, an Energy Performance Certificate (EPC) is required whenever a building is constructed, rented or sold. The certificate will provide a rating of the energy efficiency and carbon emissions of a building from A to G, where A is very efficient and G is very inefficient.

EPCs are produced using standard methods with standard assumptions about energy usage so that the energy efficiency of one building can easily be compared with another building of the same type. This allows prospective buyers, tenants, owners, occupiers and purchasers to see information on the energy efficiency and carbon emissions from their building so that they can consider the energy efficiency costs of their investment.

An EPC is accompanied by a report that lists cost-effective and other efficiency measures to improve the energy rating of the building, such as low and zero carbon generating systems. The certificate is also accompanied by information about the higher rating that could be achieved if all the recommendations were implemented.

SCENARIO ANALYSES

To enhance the rigour of the preliminary legal and economic analyses undertaken in this report, a basic mandatory disclosure regime and a number of alternatives measures were examined.

The basic mandatory disclosure regime assumes that it would be most effective for disclosure to occur at both the point of sale and lease, and that a means of rating energy efficiency will be developed for all types of commercial buildings. The scope of the regime has been limited to properties over 2000 m^2 net lettable area.

The alternative measures examined include the following:

- The enhancement of due diligence processes to include the mandatory consideration of the energy efficiency of commercial buildings.
- The mandatory inclusion of Green Lease Schedules (GLS) in commercial building lease agreements for properties over 2000 m^2 net lettable area (as is currently the case for office buildings occupied by Australian Government agencies under the Energy Efficiency in Government Operations policy).
- Schemes that provide direct incentives to improve the energy efficiency of commercial buildings.

The alternative measures are not intended to be exhaustive of all the possible measures that could be used to improve the energy efficiency of existing commercial buildings. They were chosen because they represent some of the more apparent alternatives to a basic mandatory disclosure regime.

LEGAL

Power to legislate

It is possible from a purely 'legal process' point of view to legislate for Mandatory Disclosure of commercial building energy efficiency. Legislation could be enacted by the Commonwealth or by States and Territories. However, the Commonwealth's power to legislate may not extend to the full range of commercial and lease transactions in Australia.

Meaning of the term 'commercial building'

There is no formal legal definition on what constitutes a 'commercial building'. It is noted that further consideration will be given to the scope of this term. Ultimately, what is determined to be a 'commercial building' for the purposes of Mandatory Disclosure will form the basis of how this term will be defined in legislation.

Main options for legislation governing mandatory disclosure of commercial building energy efficiency

Option 1 - Commonwealth legislates for Mandatory Disclosure of commercial building energy efficiency

It is considered that the Commonwealth Parliament could enact legislation which would meet the objectives of the proposal for Mandatory Disclosure of commercial building energy efficiency to a significant but not complete extent. This power may be exercised under the

authority of the corporations power in s 51(xx) of the Constitution, supplemented by the Territories power in s 122 and the incidental power in s 51(xxxix).

Legislation enacted under these powers would cover the majority of commercial property sale and lease transactions which occur in Australia. However, there would be some commercial property sale and lease transactions which would not be captured by this Option. For example, transactions in which a retail sole-trader leases retail space in a State-owned hospital or university, or where a legal partnership leases office space to an accounting partnership, may not be captured.

Alternatively, the Commonwealth could use the taxation power in s 51(ii) to establish a disclosure scheme based on taxation disincentives for non-disclosure. The Commonwealth may also seek a referral from the States to enact uniform legislation (s 51xxxvii). There may also be some scope for using the external affairs power in s 51(xxix). The Office of International Law in the Attorney-General's Department should be consulted in relation to this issue.

Option 2 - States and Territories enact new uniform legislation

The States and Territories could agree to enact new uniform legislation. If agreement could be reached this may be a viable alternative to Commonwealth legislation. The down side to this approach is that it may take longer to achieve a completely uniform agreement across all jurisdictions. It would not be desirable to have a situation where the mandatory disclosure obligations were different across the jurisdictions.

Option 3 - States and Territories amend existing legislation

The States and Territories could amend existing legislation to require mandatory disclosure. As existing legislation varies across jurisdictions this is the least desirable option as it could further complicate the current situation and lead to greater inconsistency across the nation.

Threshold issues for legislating for Mandatory Disclosure

Before any consideration of the legislative framework can commence there are a number of threshold issues which need to be resolved. Essentially, these threshold issues are not legal ones as they will form the structure and policy objectives, as well as the practical and possible financial scheme, upon which legislation will be based. These threshold issues include considerations such as:

a) The development of a scheme that is simple and consistent to optimise the workability and market acceptability of the scheme.
b) The metric to be adopted (noting that this needs to be consistent).
c) The need for agreement on mechanisms for achieving metering in buildings.
d) The need to develop a scheme for the sourcing and appropriate training of competent assessors to undertake the required analysis.
e) Establishment of data and record keeping management requirements.
f) The need for agreement on a quality assurance scheme.
g) The need for further economic analysis to assess the cost and risk associated with the implementation and operation of the scheme. The cost of the scheme (as it impacts on all aspects and participants) needs to be assessed in more detail.

The legal advice on the legislative options assumes that the initial threshold issues have been, or are capable of being, resolved to the point that a viable scheme can be consistently and viably implemented across the country. If the threshold issues are not fully resolved then it is highly probable that such legislation will be unworkable.

It should also be noted that the legal process involved in the passage of legislation includes considerations of the practical and commercial aspects of a bill, any stakeholder consultation and how the bill may impact affected community and business interests, as well as the acceptance by government of a workable legislative framework.

Types of mandatory disclosure schemes

Disclosure Outcomes

There are two main disclosure outcomes that are only viable if the following threshold questions are resolved:

- What information is to be disclosed?
- To whom is this information to be disclosed?
- How is this information to be disclosed?
- When it is to be disclosed?

Outcome Number 1

The first possible outcome is to require disclosure of the energy performance of a building (in particular circumstances) against specified metrics. This disclosure is based on the performance or efficiency standards that exist at the time.

While the disclosure does not immediately lead to improvements in energy efficiency it does allow the market economy to act as a driver for improved energy efficiency. By disclosing energy performance market forces should eventually produce more efficient buildings because such efficiencies could reduce costs for landlords and tenants, as well as generate better returns and improved property values. The extent to which the market will respond on this basis would need to be further assessed and it is noted that more detailed economic assessment may also be required for the next stage of this Outcome.

Outcome Number 2

The second possible outcome is to create a two tier regime. Tier one would involve legislation to achieve certain prescribed standards of energy performance. Tier two would require disclosure legislation and be built upon tier one.

While a consideration of a two tier regime is outside of the scope of this report, it is mentioned briefly because this report discusses mandating certain elements of the GLS which requires that specific performance outcomes and processes be legislated.

A two tier regime would result in setting energy efficiency measures for both the operational measures and the disclosure obligations in legislation. While the use of legislation for a two tier regime would act as a stronger driver for improved performance and efficiency it will result in a development and implementation process that is more complex and time intensive.

Prerequisites to selecting the preferred outcome

Both possible outcomes are likely to require significant groundwork to establish the scope and nature of disclosure. Outcome Number 2 would involve even more investment in developing a mandatory compliance regime as well as a disclosure regime. There is already some degree of compliance required via existing mechanisms, such as the BCA, but the reach of these is more limited at this stage. It would be likely that Outcome Number 2 would encounter more resistance from some sections of the market and further research into the viability of this would be needed.

Assumption of Outcome Number 1

The legal advice is provided on the basis that Outcome Number 1 reflects the present intention.

How will the scheme be delivered

Consideration needs to be given as to whether the Mandatory Disclosure obligations are to be delivered via Commonwealth legislation (in this case the Australian Government could only legislate within the scope of its constitutional power) or State and Territory legislation (which will involve detailed consultation with the states and territories). The Mandatory Disclosure obligations could also be implemented via a combination of Commonwealth, State and Territory legislation.

Options

The main options are:

a) A single federal scheme enacted under Commonwealth legislation supported by a suitable head of constitutional power (the consideration provided by this Report regarding the extent of Commonwealth constitutional power will need to be considered).
b) Legislation enacted by the Commonwealth as a result of a referral by the States to enact uniform legislation.
c) States and Territories agree to enact new uniform legislation.
d) States and Territories agree to amend existing legislation.

A Commonwealth legislated framework provides the simplest opportunity for a nationally consistent scheme. While the federal framework would be the preferred approach there are potential limitations. No matter which approach is adopted there will need to be cooperative consultation between the Commonwealth and the States and Territories.

If options a) or b), or a) and b), are not acceptable the next preferred option would be option c). Option d) is the least preferred option as it is most likely to result in even more inconsistencies across jurisdictions. The existing legislation is already diverse and option d) would only further compound the disparities between jurisdictions which would make it difficult to achieve the required outcomes of simplicity, ease of use and consistency.

Enforcement

Enforcement of a Mandatory Disclosure scheme adds a further layer of complexity. Any enforcement mechanisms will depend upon which type of Mandatory Disclosure scheme is

adopted. In developing an enforcement regime to support the Mandatory Disclosure scheme consideration will need to be given to:

a) The purpose of any enforcement mechanisms.
b) Whether those mechanisms are triggered at the option of the tenant/purchaser or apply in all cases.
c) Whether the enforcement mechanisms are appropriate from a policy perspective.
d) The response from the market, particularly if the enforcement mechanisms are onerous or have the potential to significantly impact commercial leasing/sale transactions.

With these considerations in mind, the following enforcement mechanisms could be legislated to require:

a) The imposition of civil penalties.
b) Rendering the commercial leasing or sale transaction voidable at the option of the tenant/purchaser where the tenant/purchaser will be able to withdraw from the transaction at any time prior to completion of the lease/sale without penalty from the landlord/vendor.
c) Financial disincentives, for example, where rent and other monies due under a lease will not be payable until such time as the disclosure has been made.

Further consideration needs to be given to circumstances where the failure to disclose was negligent as opposed to where the landlord/vendor failed to disclose, or to sufficiently disclose innocently, and has otherwise acted honestly in the transaction and could be reasonably excused from liability.

Additionally, the impact on the tenant/purchaser may be a factor. For example, consider circumstances where the tenant would have otherwise known the energy efficiency of the building (i.e. an existing tenant re-negotiating a new lease for the same premises) and is in no worse a position than had the disclosure previously been made. On the other hand, the impact on the tenant from the landlord's/vendor's failure to disclose may have a detrimental effect to the reputation of a party.

If enforcement legislation is to have 'teeth', then it is suggested that all the above options be considered as part of an enforcement regime. However, the enforcement mechanisms could be tempered where the landlord/vendor has otherwise acted reasonably and honestly and the tenant/purchaser is in no worse a position than if the disclosure had been made.

Depending on the terms of the particular lease a tenant may have its own direct remedies for non disclosure by the landlord. For example, a lease may provide that a landlord is to comply with all laws. Failure to comply with the Mandatory Disclosure legislation would give the tenant remedies directly against the landlord for breach of that lease obligation under the lease. Whether that remedy exists and what the remedy would entail would depend on the precise terms and conditions of the particular lease in most instances. This demonstrates that while there may be personal remedies between landlords and tenants, the very nature of leasing results in those remedies being highly variable and incapable of consistent application.

A final consideration is whether to have an exemption policy apply to certain commercial buildings similar to the exemptions in the Energy Efficiency in Government Operations Policy. This would allow some flexibility for certain situations. For example, where a commercial building offered for sale or lease is heritage protected and so may require the Mandatory Disclosure obligations to be modified or rendered inapplicable.

ECONOMIC

The purpose of mandatory disclosure is to enhance consideration by the market to energy-related commercial building costs at the point of transaction. In so doing, it is intended to stimulate investment into energy efficiency improvements.

A national mandatory disclosure regime for commercial buildings needs to be assessed in the context of other policies related to the overall desire to enhance energy efficiency and reduce greenhouse gas emissions. A key mechanism to reduce Australia's emissions is the establishment of an emissions trading scheme (ETS), which was foreshadowed in the recently released report by the Prime Minister's Task Group.

Whatever form the emissions trading scheme takes, it is likely to be aided by specific sector-based policies, if not permanently, at least during a transition period. Various distortions in the economy ('market failures') may mean that the price signals of a trading scheme do not lead the market participants to respond in an efficient way and intervention to remove these market failures may be desirable.

The Task Group report specifically identifies the building sector as one area where market failures may impede the effective workings of an emissions trading scheme, stating that:

> *'[T]here is some evidence that households and firms do not always take up opportunities for seemingly cost-effective improvements in energy efficiency' (National Emissions Trading Taskforce 2006)*

Upfront costs have been raised as a possible barrier to the take up of cost-effective improvements. In the case of residential buildings, liquidity constraints, access to finance and mortgage stress may be an issue for homeowners. However, the commercial building sector is dominated by large sophisticated investors with ready access to financial markets, so the issue of upfront costs is not a plausible source of market failure in the case of commercial buildings (though may remain relevant for residential buildings).

The average commercial building has an ABGR energy rating of around 1.5 to 2 stars ('poor' to 'good'). On a scale of up to five stars ('exceptional'), there is room for improvement. However, while there is scope for improvement, it is difficult to say what the optimal level of efficiency is for existing buildings. If the cost of improving buildings is greater than the cost of reducing the same level of emissions elsewhere in the economy, then it will not be optimal. Importantly, the cost of reaching a given level of energy efficiency will differ between buildings and, hence, the optimal level of energy efficiency.

Preliminary modelling into the effect of an ETS indicates that if the average office building has an ABGR star rating of 1.5 to 2 stars, the energy bill per square metre would increase from around \$17 to \$19[1] per annum (a 12% price increase). This means that energy consumption for a 10,000 m^2 office building would increase from \$170,000 to up to \$190,000 per annum (an increase of up to \$20,000).

However, with current office occupancy costs ranging from \$325 to \$780 per square metre for major Australian cities, energy costs will account for only 2% to 5% of total occupancy costs. With the introduction of a broad-based ETS (and a carbon dioxide price of \$40) energy costs

[1] Assuming that for a \$40 cost increase per tonne of CO_{2e} emitted, \$10 per tonne is passed on to consumers, who emit 0.2 tonnes, costing them \$2.

would increase by around 0.5% to 1% to a share of occupancy costs of approximately 2.5% to 6% (which is still small relative to total occupancy costs).

Given this, it has been argued that the small proportion of costs attributable to energy use has meant building owners and users do not seriously consider ways for improving energy efficiency. Even if demand for tenancies was reasonably responsive to occupancy costs, the small proportion of energy costs within total occupancy costs means that demand for tenancies does not necessarily respond to energy prices.

Several studies demonstrate there is substantial scope for cost effective investment in energy efficiency that is not utilised. For example, the IPCC states that '*by 2030, about 30% of the projected GHG emissions in the building sector can be avoided with net economic benefit*'. Hence, while there is little incentive for individuals to make this investment, in aggregate the potential abatement opportunities from the commercial building sector may be large.

While a broad-based ETS increases the number of cost-effective energy efficiency measures and potential for reductions in greenhouse gas emissions (with the extent depending on the carbon price), on its own it may not address the problem where some businesses do not introduce these measures despite their cost-effectiveness. Hence, there may be a role for the government to play in reducing emissions which do not appear to be sensitive to energy prices, particularly at relatively low carbon prices.

There are a number of potential sources of market failure which may result in the amount of energy efficiency (and, therefore, abatement) being less than the socially optimal amount. These can be divided into two main groups: those that prevent privately cost-effective expenditure (the 'no regrets' options), and those that prevent expenditure that is socially, but not privately, cost effective. These market failures are likely to be present in varying degrees and policies should address those failures that create the largest costs.

The largest market failures and those which need to be addressed primarily are:

- The lack of information regarding cost-effective energy savings.
- The externality caused by greenhouse gas emissions.

Split incentives are also of concern if the costs of improvements cannot be passed on to those who benefit from them. The remaining market failures appear to be small relative to the ones listed above. Asymmetric information is a problem to the extent that the search costs are too high to justify an energy assessment. However, with energy assessments (reporting an ABGR rating) costing around $2,000, the costs of obtaining this information is only a small proportion of the total cost of building occupancy costs and energy consumption. Hence, it does not appear to be a major source of failure for the sector.

The policy options analysed can essentially be divided into two groups: those that encourage the take-up of cost-effective investment and those that encourage improvements that are socially, but not privately, cost-effective. Policies that fall into the former category include awareness campaigns, mandatory disclosure of energy rating, enhanced due diligence and GLS. Those that fall into the latter include price incentives such as carbon taxes or energy efficiency subsidies and direct emissions restrictions, such as mandatory energy efficiency levels similar to those used for new government buildings.

Another important way of categorising the options is in terms of their degree of prescriptiveness or the magnitude of intervention required by the government. General

awareness raising measures do not place high demands on either the government, in terms of measuring compliance, or on the applicable individuals. However, they are also the least likely to achieve significant action. Disclosure regimes and GLS are more prescriptive and require additional resources for ensuring compliance, with GLS being the more costly of the two. Given the possibility of firms 'gaming' the regulator and exploiting loopholes in some of these cases, substantial resources may be required to ensure compliance with the spirit and letter of the law.

The possibility of regulatory failure is also a necessary consideration in this regard. This uncertainty may mean that overly prescriptive policies place excessive and undesirable costs on businesses while price based policies may not result in the required level of abatement. Light-handed intervention is preferable in these cases, at least initially, to avoid the risk of regulatory failure.

Given the above, a less prescriptive approach could be implemented first, such as an information campaign and the promotion of voluntary disclosure and GLS. This would also allow time for data collection (a major gap is not knowing the actual number of buildings >2,000 m^2) while clearly signalling to the market that energy efficiency in commercial buildings is an area of policy interest. An ETS would also add impetus to action taken, albeit with calculations showing that this will only add slightly to building operating costs. If the market is seen to be unresponsive to these signals, or if progress is insufficient, then more prescriptive policies could be considered.

The preliminary economic analysis indicates that it is not clear how mandatory disclosure would achieve meaningful increases in commercial building energy efficiency. Equally, current data limitations and the heterogeneity of commercial buildings means that it cannot be conclusively proven that mandatory disclosure would be completely ineffective.

Hence, before implementing a mandatory disclosure regime, data should be collected and analysed to assess its impact upon the commercial building sector. A lack of precise information and a strong desire by the community to improve energy efficiency, combined with the moderate compliance costs of implementing disclosure, suggests that this policy comes at a moderate cost and brings potential upside. But once implemented, the policy will need to be monitored closely to ensure the benefits of mandatory disclosure are realised.

1 INTRODUCTION

1.1 POLICY CONTEXT AND SCOPE

In 2004, the Energy White Paper, *Securing Australia's Energy Future*, was released by the Australian Government. In conjunction with other initiatives, this paper endorsed a national program for the mandatory disclosure of commercial building energy efficiency 'in leases and sales agreements' 'to potential purchasers and lessees' (Energy Task Force 2004, pp. 112 & 181). Subsequently, in December 2004, the Ministerial Council on Energy (MCE) included a program for the mandatory disclosure of commercial building energy efficiency in the implementation plans for Stage One of NFEE (2007).

MCE was established by the Council of Australian Governments (COAG) in 2001 to deliver economic and environmental benefits to Australia through the implementation of COAG's national energy policy framework. MCE is comprised of those Ministers responsible for energy in the Australian, State and Territory Governments (Department of Industry Tourism and Resources 2004).

NFEE (2007) was established by MCE in acknowledgement of the significant benefits that can be achieved through coordinated action on energy efficiency by Australian, State and Territory government agencies. NFEE provides a national platform for improvements in energy efficiency, including a wider application of energy standards, improving capacity to deliver energy savings and raising awareness of energy efficiency issues among consumers. NFEE includes a package of energy efficiency programs for equipment and appliances, as well as energy efficiency standards for buildings.

This report has been prepared to address the deliverables in NFEE Stage One that relate to the mandatory disclosure of commercial building energy efficiency. A separate program exists for the mandatory disclosure of residential building energy efficiency.

Under NFEE Stage One, the mandatory disclosure programs are intended to complement the implementation of the energy efficiency provisions in the Building Code of Australia (BCA). The BCA contains minimal technical requirements enforceable through respective State and Territory building regulatory regimes. The requirements of the BCA generally apply to new buildings and new work within existing buildings. On the other hand, the mandatory disclosure programs are intended to capture the large proportion of existing buildings not captured by the BCA's energy efficiency provisions.

Focussing on the mandatory disclosure of commercial building energy efficiency, the purpose of this report is to present an overview of the key issues associated with the development and implementation of a national regime. This includes examination of the technical, legal, administrative and economic considerations.

Alternative measures for improving the energy efficiency of Australia's commercial building stock are also briefly examined to enhance the rigour of the decision making process. These measures represent some of the more apparent alternatives to a basic mandatory disclosure regime and are not intended to be exhaustive.

This report reflects a first order analysis of the context, considerations, costs and benefits of mandatory disclosure. Depending upon the future direction of this initiative, more thorough developmental work and economic analysis may be required as a next step.

1.2 NFEE OBJECTIVE

The NFEE Stage One Implementation Plans (NFEE 2004) state that the specific objective of having a mandatory disclosure regime for the energy efficiency of commercial buildings is to:

> '[E]nsure credible and meaningful information is publicly and readily available to potential purchasers and renters/lessees on the relative energy performance of buildings. This component ensures that potential buyers or tenants can compare the performance of buildings on a 'like-with-like' basis when making purchasing or renting/leasing decisions. This component requires:
>
> (a) Agreement on metrics and tools for measuring indicative energy performance of buildings, based on an assessment of what measures are most likely to affect behaviour.
> (b) Enactment of legislation to ensure information of value to users is disclosed at appropriate times.
> (c) The establishment of administrative frameworks to oversee disclosure processes within jurisdictions.'

The Implementation Plans further state that the key element of the regime is:

> 'Mandatory building energy efficiency disclosure at time of sale or lease/rent that delivers higher market value to higher energy efficiency buildings.'

In simple terms, it is implied that disclosing the energy efficiency of commercial buildings, and thereby having informed customers (i.e. purchasers and lessees), may affect property values and act as a catalyst for building owners to improve the energy efficiency of their stock.[2] Furthermore, disclosure of the energy efficiency of commercial buildings is seen as an important component of the many different measures available for reducing consumption, including energy efficiency standards, and economic incentives and/or penalties (AGO 2005 p.6). These basic concepts and the interrelationship between the disclosure of building energy efficiency and other NFEE initiatives are shown diagrammatically in Figure 1.1.

Notwithstanding the above, the preliminary economic analysis in this report will examine whether disclosure is an *effective* means of stimulating improvement in the energy efficiency of commercial buildings.

[2] For the purpose of this report, 'energy efficiency' is deemed comparable with 'energy performance' and both have a strong correlation with 'greenhouse performance'.

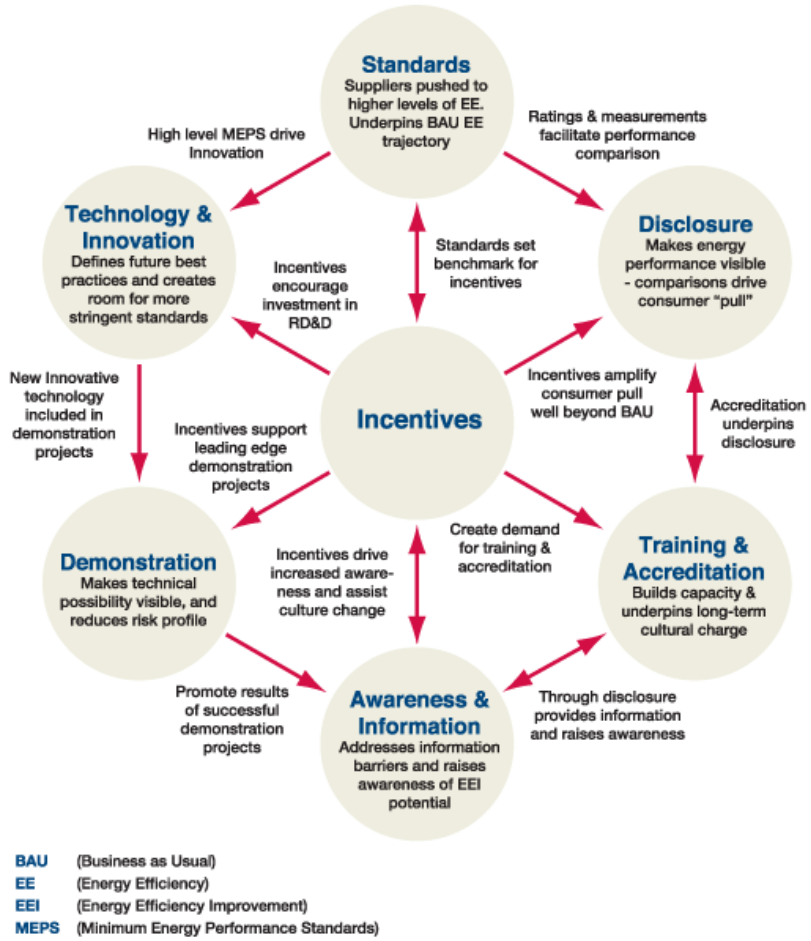


Figure 1.1 Interrelationship between disclosure and other NFEE policy considerations (NFEE 2007)

1.3 APPLICABLE BUILDINGS

There are a number of methods used to define commercial buildings. However, for the purposes of this report, the term 'commercial building' will be used to mean Class 3, 5, 6, 7, 8 and 9 buildings as defined in Part A3 of Volume One of the BCA (ABCB 2007). Common building types that fall within these classifications include hotels and motels, offices, shops, cafes and restaurants, service stations, multi-storey car parks, warehouses, laboratories, factories, hospitals, schools and auditoriums.

A full description of these classifications is contained within Appendix A.

1.4 SECTOR PROFILE

Building construction is a significant component of the Australian economy, representing approximately 9.3% of Gross Domestic Product. In the three years to 2004/05, activity averaged $77.7 billion per annum for new buildings, alterations and additions. In real terms, building expenditure has grown at 3% per annum for the last 30 years.

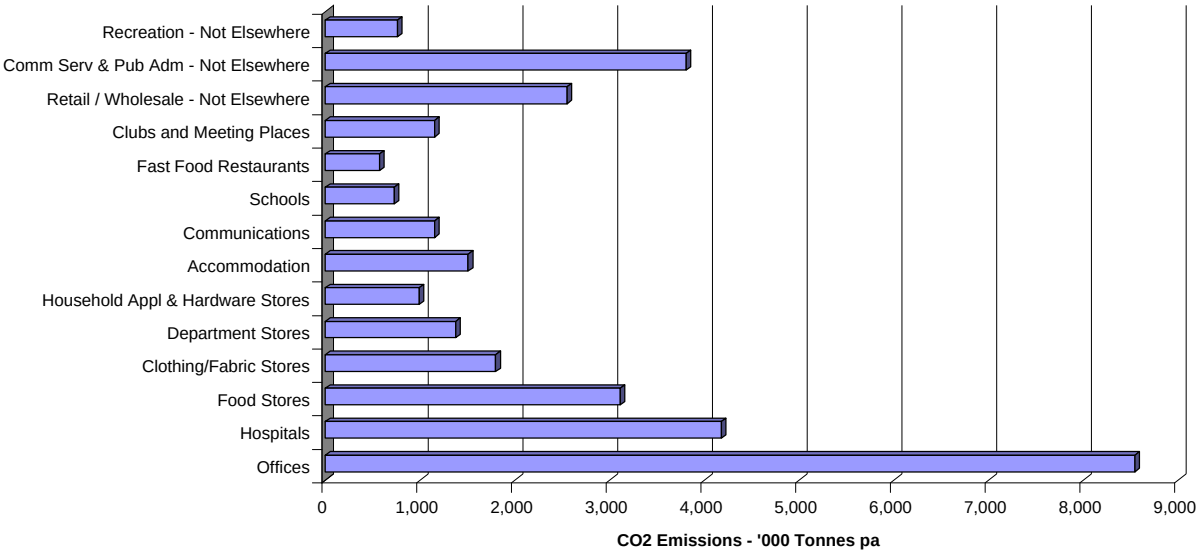
Approximately one quarter (27%) of building expenditure over the last five years has been on commercial buildings (i.e. stock that the Australian Bureau of Statistics (ABS) classifies as commercial, industrial and other buildings).
While the ABS does not have data on the overall value of Australia's commercial building stock, it has been estimated to be around $575 billion (AGO 2006b). It is also estimated that

75% of annual investment is used for building maintenance and replacement rather than the construction of new stock. Commercial buildings are considered to have a 38 to 58 year life span after which they are subject to redevelopment.

In terms of greenhouse gas emissions, commercial buildings are responsible for approximately 10% of Australia's total emissions (Wilkenfeld & Energy Strategies 2003). Office buildings contribute the most significant proportion of emissions for the sector, accounting for approximately 27% of emissions. Hospitals are the second largest emitters at 13% (refer to Table 1.4).

Research undertaken in 1999 (AGO 1999a) found that electricity was responsible for 65% of energy use and 89% of emissions from the commercial sector. Space cooling, ventilation and lighting were found to be the most significant causes of greenhouse gas emissions at approximately 71% of total emissions. However, this figure varies significantly depending on the specific type of building.

Table 1.1 Australian Commercial Sector – CO_2 Emissions by Building Type (AGO 1999a)



1.5 TRANSACTIONAL CONTEXT

There are many factors that can influence the value of commercial properties, of which energy efficiency is just one consideration. Some of the more significant factors, from the perspective of purchasers and lessees, can include:

- Location.
- Operational requirements.
- Lease terms (or value of leases).
- Upfront and operational costs.
- Building amenity (including the services provided, quality of finishes, proximity to transport).
- Functionality.
- Corporate image.

Disclosure of the energy efficiency of commercial buildings enables potential purchasers and lessees to exercise consumer preference on energy efficiency in addition to the building

attributes already disclosed at the point of sale or lease. More broadly, the level of energy efficiency will influence consideration of the performance of a building, its impact on staff (in terms of amenity and internal comfort conditions), energy expenditure, as well as expenditure on the maintenance and replacement of building elements. From an environmental perspective, the level of energy efficiency will influence consideration of the carbon footprint (or greenhouse impact) of the building and whether this correlates to the objectives, intrinsic or extrinsic, of the potential purchaser or lessee. From an investment perspective, the level of energy efficiency will influence long-term financial benefits and market exposure considerations. For example, because there is an increasing demand for energy efficient office accommodation, particularly by government agencies, procurement of an inefficient building may affect the ability to obtain lessees or future purchasers of property.

1.6 HIGHLIGHTED ISSUES

An Issues Paper was prepared by Bassett Applied Research (2007) as part of an initial phase of this report. The paper highlighted a range of considerations for a viable mandatory disclosure regime in Australia, including the following fundamental outcomes:

- The metric for measuring and disclosing commercial building energy efficiency must be simple, consistent and meaningful.
- The scheme must be able to assess both new and existing buildings.
- Adequate metering is essential for energy data collection.
- Competent assessors need to be identified, developed and trained to undertake the required analysis and reporting.
- A robust quality assurance scheme is required.
- Comprehensive energy data and record management processes are required.
- Costs associated with the implementation and operation of the regime must be minimised.
- The regime needs to be simple and nationally consistent to minimise the potential for contradictory or conflicting legislation, jurisdictional variations and other complications that could potentially detract from the operation of the regime.
- A comprehensive education programme is required to inform all stakeholders of the opportunities that disclosure can bring to their business/operations.
- The regime must provide for regular feedback and review to improve its operation and implementation.

Understanding of the key economic drivers to improving building energy efficiency will highlight a range of technical considerations that must be addressed. In turn, this will lead to an understanding of the administrative issues involved in the development of a nationally consistent framework for mandatory disclosure.

The above issues are discussed in further detail in the following sections of this report.

1.7 CONSULTATION

Broad consultation has been undertaken by Bassett Applied Research and the Department of the Environment, Water, Heritage and the Arts (DEWHA) as part of this investigation into a national regime for the mandatory disclosure of commercial building energy efficiency. This has included workshops and discussion with a range of industry practitioners and stakeholder groups. The professions covered by this process have included real estate agents, property owners and investors, energy efficiency consultants and academics, architects, building

services engineers, facilities managers and policy makers from the Australian, State and Territory governments.

The consultation process undertaken during the initial stages of this project is detailed in Section 8 and Appendix D of the Issues Paper prepared by Bassett Applied Research (2007).

[Editorial Note: Feedback from the Consultation Draft will be covered in the final Concept Report.]

1.8 REPORT FORMAT

The research and analysis underpinning this report has highlighted the complexity of commercial building mandatory disclosure. For simplicity, issues have been grouped in this report according to technical, administrative, international, legal and economic categories and presented linearly. However, this belies the complex interrelationship between issues. The figure below attempts, in part, to demonstrate the multi-factorial nature of the development and implementation of a national mandatory disclosure regime for commercial building energy efficiency (refer to Figure 1.2).

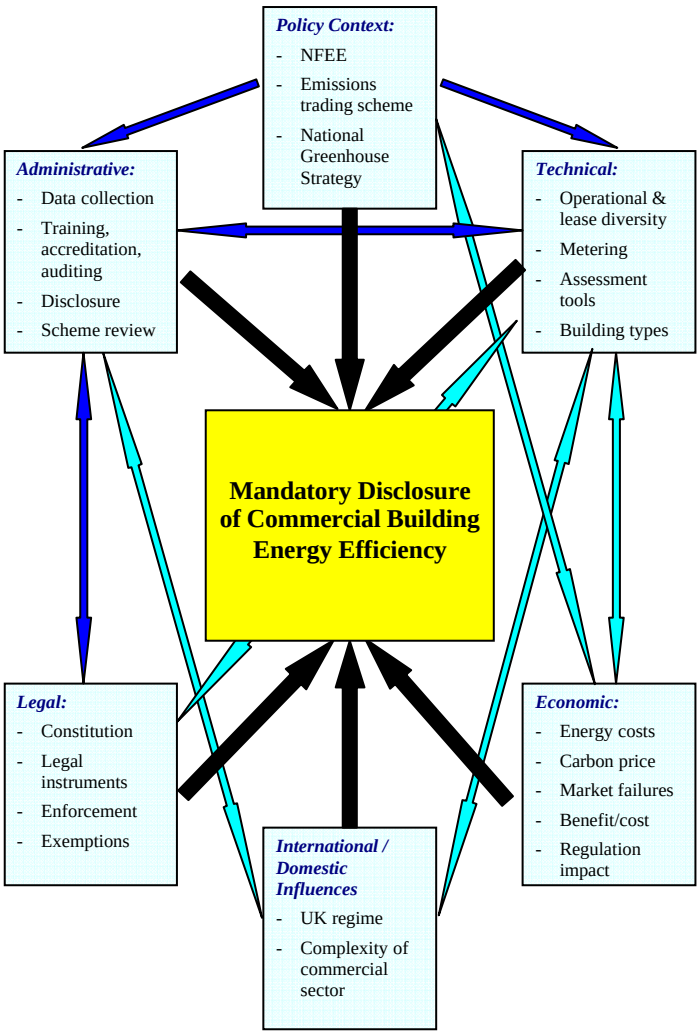


Figure 1.2 Interrelationship of issues

2 TECHNICAL AND ADMINISTRATIVE CONSIDERATIONS

2.1 TECHNICAL CONSIDERATIONS

Fundamental to any scheme for the disclosure of commercial building energy efficiency is the need for a means of measuring, or rating, the energy efficiency of commercial buildings. The NFEE Stage One Implementation Plans (2004) also state that the rating needs to enable potential buyers or tenants to compare the performance of buildings on a 'like-with-like' basis.

To satisfy this objective, there are a number of complex issues that need to be addressed including:

- The diversity of commercial buildings.
- The factors that affect the level of energy efficiency of commercial buildings.
- The metric used to describe the energy efficiency of commercial buildings.
- The availability of suitable tools for rating commercial building energy efficiency taking into account the particular building classification and climatic conditions.
- The availability of suitably qualified assessors to rate the energy efficiency of commercial buildings.
- Access to energy consumption data and associated information in order to establish efficiency benchmarks.

2.1.1 DIVERSITY OF COMMERCIAL BUILDINGS

OCCUPANCY AND USE OF COMMERCIAL BUILDINGS

The method used to rate the energy efficiency of commercial buildings needs to cater for the diversity of commercial building stock. This is a particularly significant issue for non-office buildings. While office buildings tend to be relatively homogeneous, in terms of occupancy and use, non-office buildings vary greatly.

In order for commercial buildings to be able to be compared on a 'like-with-like' basis, there is a need for buildings of a similar nature to be grouped together under the disclosure regime. The BCA provides a ready-to-use system for classifying buildings. This system was originally developed to cater for fire, health and safety regulations. However, it has also been used in conjunction with energy efficiency provisions for commercial buildings since May 2006.

There are a number of benefits to using the classification system in the BCA. The system is already used in the commercial building sector and is familiar to practitioners. This system also has rules for dealing with mixed-use buildings and has the flexibility to allow the implementation of sub-classifications where necessary. This means, for example, that a disclosure regime can either deal collectively with Class 6 buildings or separately with Class 6 restaurants, Class 6 shops, Class 6 service stations etc.

LEASING OF COMMERCIAL BUILDINGS

The varying tenancy arrangements for commercial buildings add another layer of complexity to the technical elements of a disclosure regime. Commercial buildings often contain multiple tenants and the lease agreements with tenants in the same building can be quite different.

The diversity of tenancy arrangements has implications in terms of whether the disclosure regime should rate the energy efficiency of a whole building or just each separate tenancy. Rating the efficiency of the whole building is likely to be difficult where there are multiple tenancies to assess. However, rating separate tenancies is also likely to be problematic where there are shared building services.

Under the Australian Building Greenhouse Rating (ABGR) scheme, a methodology has been developed to overcome this issue. This enables whole office buildings to be rated under the ABGR scheme, or separate ratings to be carried out for the base building and tenanted areas of office buildings. The ABGR scheme is discussed in more detail under 2.1.4.

2.1.2 FACTORS AFFECTING ENERGY EFFICIENCY

The amount of energy consumed by commercial buildings, and how efficiently that energy is used, is contingent upon a number of factors. The fabric and services inherent in the building will affect the energy use as will the operation of the building and the behaviour of the occupants. Some of these factors can be controlled and managed relatively easily, while others need to be addressed by enhanced management systems.

These factors can be categorised into five key areas (Bassett Applied Research 2007) as per Table 2.1.

Table 2.1 Key areas affecting the energy efficiency of commercial buildings

Key area	Potential negative impacts on building energy efficiency
Design	• Building performs inefficiently due to poor design and specifications. • Energy efficiency features have excessive payback periods. • Building services oversized.
Construction	• Buildings not constructed as per design and specifications. • Inferior construction materials, equipment and fittings used.
Building management	• Inadequate commissioning of building. • Lack of meaningful energy consumption data/insufficient metering. • Ineffective use of building management system. • Ineffective energy efficiency requirements in maintenance contracts.
Fit out	• Selection of inefficient equipment, appliances and lighting. • Fit out not in accordance with original design and adversely affects the efficiency of lighting and HVAC.
Tenant behaviour	• Excessive use of energy intensive equipment. • Inappropriate use of lighting and HVAC. • Unplanned occupancy profile (e.g. hours of operation, density of occupancy, etc). • Excessive heat loads. • Lack of communication with building management in terms of building operation. • Failure to report equipment and appliance faults.

Arguably, an effective disclosure regime needs to give the parties involved adequate information to enable the identification of the impediments to achieving a high level of energy efficiency in a particular building. In turn, this will enable these parties to make a more

informed decision about the extent to which the energy efficiency of the building affects its value.

2.1.3 METRIC FOR DESCRIBING ENERGY EFFICIENCY

In addition to addressing the diversity of commercial building stock, the information provided on the energy efficiency of buildings needs to be meaningful and clearly understood. In this regard, consideration needs to be given to the metric used to describe the energy efficiency of commercial buildings.

There are three common metrics currently used to describe the energy efficiency of commercial buildings: mega joules per square metre annum (MJ/m^2.annum); mega joules per person annum (MJ/person.annum); and star ratings. MJ/m^2.annum is commonly used to describe the energy efficiency of a whole building or base building. MJ/person.annum is commonly used to describe the energy efficiency of a tenancy. Star ratings can be used to describe either the whole building, base building or a tenancy.

Star ratings are commonly used for reasons of simplicity. Presenting the energy efficiency of buildings in stars enables normalisation of the performance bandwidths to account for the climatic conditions of the building location. Star ratings enable the energy efficiency of buildings in different climates to be described on an equal basis. Outside of normalisation, energy values per se can be misleading. For example, equally efficient buildings in Darwin and Melbourne would use vastly different amounts of energy. On a mega joule basis, the Darwin building would appear less efficient than the Melbourne building because of the greater use of air-conditioning in Darwin.

The energy efficiency of commercial buildings can also be extended to include greenhouse emissions by taking into account the source of the energy used. In this case, the buildings performance is described in terms of kilograms of carbon dioxide equivalent per square metre annum ($kgCO_{2e}/m^2$.annum). Arguably this method of measuring the performance of buildings gives a more accurate picture of the environmental impact of the building's energy use. However, it can also be argued that it disadvantages those buildings that have little choice of energy source. In addition, the lack of greenhouse emissions attributed to hydro-electricity, and other sources of renewable energy, belie their environmental impact and can be misused to justify inefficient buildings.

2.1.4 TOOLS FOR RATING ENERGY EFFICIENCY

The energy efficiency of commercial buildings can be rated in a number of ways. The most common methods involve the use of software which rate the energy efficiency on the basis of actual energy consumption data or by modelling the predicted use of energy in a building. Additionally, broader building sustainability tools have been developed that incorporate energy efficiency with supplementary aspects of sustainability, such as water conservation and waste management.

Following is an outline of the more common rating methods used in Australia.

AUSTRALIAN BUILDING GREENHOUSE RATING SCHEME

Raw energy consumption data can be used to rate the energy efficiency of commercial buildings. However, in order to compare buildings on a like-with-like basis requires some

normalisation of the data to account for the size of the building, hours of operation and climate in which it is located.

The ABGR scheme (2002) is based on a software tool that uses actual energy consumption data to rate the energy efficiency (in terms of greenhouse performance) of office buildings on a scale of one to five stars (refer to Figure 3.1). The scheme rates the greenhouse performance of office buildings by taking into account a number of factors including the amount and source of energy used, the size of the building, hours of use, equipment density and climate. The ABGR scheme can be used to rate a tenancy, base building or whole office building.

The ABGR scheme has been developed by the NSW Government and is currently administered nationally by the NSW Department of Environment and Climate Change. The ABGR scheme is supported by a rigorous training and accreditation scheme for assessors.

While currently the ABGR scheme can only be used to rate office buildings, in theory, the scheme could be extended to cover other types of commercial buildings. However, the timeframe for this to occur would be largely contingent upon the availability of resources and energy data for the selected building types.

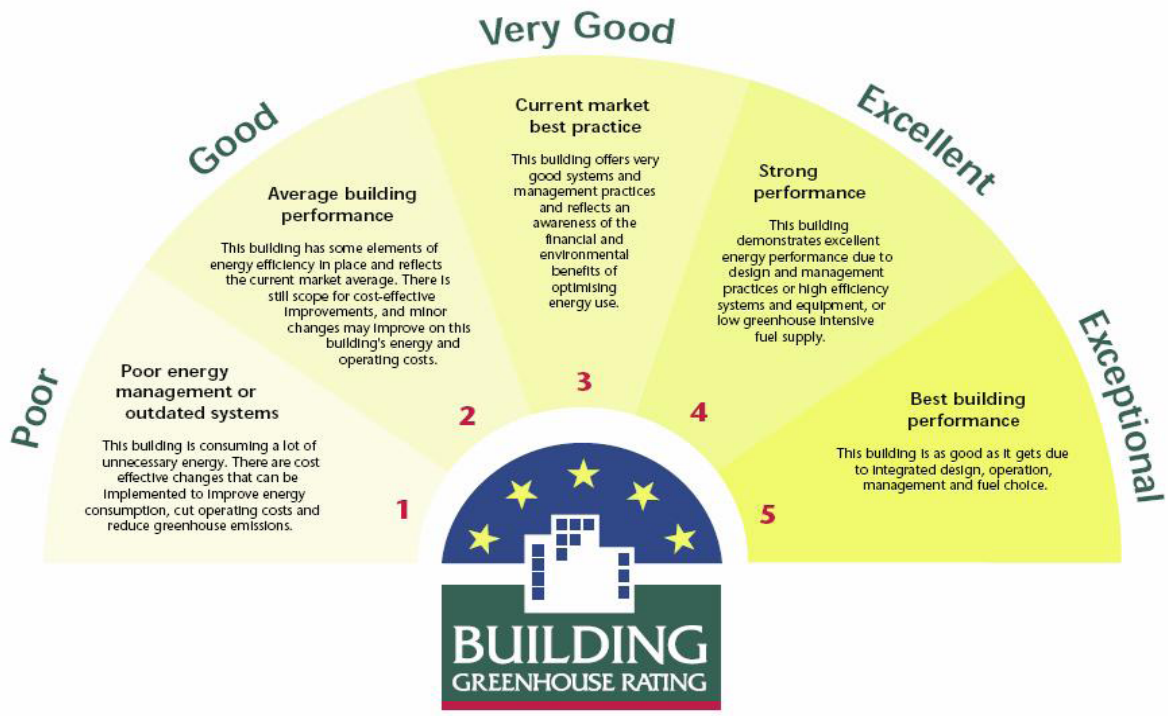


Figure 2.1 Star rating of office buildings under the ABGR scheme

MODELLING SOFTWARE

There are a number of software tools available which are able to predict the annual energy consumption of commercial buildings by modelling the use of services within the building. This includes software tools used to design commercial buildings in accordance with the energy efficiency provisions in the BCA. These tools are required to comply with the ABCB Protocol for Building Energy Analysis Software (ABCB 2006a) which describes the essential elements of suitable software. The ABCB Protocol also prescribes requirements for the development and use of the software including documentation, testing, quality assurance and user training.

A number of software suppliers have certified that their respective software complies with the ABCB Protocol. These include Beaver, IES (Virtual Environment), TAS, ICE, TRACE 700, Carrier E20-ii and the DOE suite of software: eQuest, VisualDOE and Energy Plus (Building Commission Victoria 2006).

BCA VERIFICATION METHODS

Energy efficiency provisions for Class 3 buildings were introduced into the BCA on 1 May 2005 and for Class 5 to 9 buildings on 1 May 2006. These provisions establish minimum technical requirements that apply to new building work, including work on new buildings and new work on existing buildings. These provisions apply in all States and Territories except the Northern Territory.

The BCA energy efficiency provisions contain mandatory Performance Requirements which can be met through following prescriptive Deemed-to-Satisfy Provisions or by developing Alternative Solutions. The Alternative Solutions option allows for the use of energy analysis software as described above.

The BCA refers to the use of energy analysis software as a Verification Method. There are two Verification Methods applying to Class 3 and Class 5 to 9 buildings currently in the BCA, although this will be reduced to one in the 2008 version of the BCA. The remaining Verification Method is described in Clause JV3 of Section J of the BCA.

Verification Method JV3 involves using energy analysis software to model both the building as proposed and the building as if it were constructed in accordance with the Deemed-to-Satisfy Provisions. For the proposed building to be compliant, its theoretical annual energy consumption must be less than the theoretical annual energy consumption obtained when the same building is constructed in accordance with the Deemed-to-Satisfy Provisions.

In effect, JV3 establishes a benchmarking process. The energy efficiency of a commercial building can therefore be described relative to the Deemed-to-Satisfy Provisions in the BCA. For example, a commercial building may be X% more (or less) energy efficient than the Deemed-to-Satisfy provisions.

This method of measuring and describing the predicted energy efficiency of commercial buildings has the advantage of overcoming the differences between energy analysis software. In theory, the differences between software outputs are nullified because this approach measures the relative difference between the building as designed with the building as if it were constructed in accordance with the Deemed-to-Satisfy Provisions.

BUILDING SUSTAINABILITY TOOLS

Building sustainability performance tools incorporate supplementary aspects of sustainability in addition to minimum standards of energy efficiency using the methods discussed previously.

Green Star

Green Star is by far the most common rating tool being used to assess commercial building sustainability and is a product of the Green Building Council of Australia (GBCA). It utilises the following nine categories to determine the performance of buildings:

1. Management.
2. Indoor Environment Quality.
3. Energy.
4. Transport.
5. Water.
6. Materials.
7. Land Use & Ecology.
8. Emissions.
9. Innovation.

These categories are divided further into credits which individually have the potential to improve the environmental performance of the building. Input for the energy category can either be obtained by using actual energy performance or a calculator developed by the GBCA, or by modelling the predicted energy use.

Points are awarded for actions that demonstrate the project has met the overall objectives of Green Star. After all the claimed credits in each category are assessed, a percentage score is calculated and environmental weighting factors applied. These weighting factors vary across the States and Territories to reflect the diverse environmental concerns across Australia (GBCA 2007).

The Green Star scheme is administered nationally by the GBCA and is supported by a training and accreditation scheme for assessors.

NABERS

NABERS (the National Australian Built Environment Rating System) is a voluntary performance-based rating system for existing buildings. NABERS HOME or NABERS OFFICE rate a building on the basis of its measured operational impacts on the environment in comparison to an average building (NABERS 2006). Currently NABERS only measures the operational impacts of energy use and water use. However, other elements are being developed to enable buildings to be rated on a full range of measured operational impacts—including refrigerants (greenhouse and ozone depletion potential), stormwater runoff and pollution, sewage, landscape diversity, transport, indoor air quality, occupant satisfaction, waste and presence of toxic materials.

NABERS OFFICE is tailored for use by building owners, managers and building occupants. It incorporates the Australian Building Greenhouse Rating (ABGR) scheme (discussed previously) for energy and greenhouse efficiency and the NABERS OFFICE Water rating to measure operational impacts of water use.

NABERS is a national initiative managed by the NSW Department of Environment and Climate Change and is supported by a training and accreditation scheme for assessors.

Sustainable Design Scorecard

Sustainable Design Scorecard (SDS) Non-Residential is a tool for assessing the environmental performance of new commercial buildings which can also be used for assessing major renovations. It has been developed to enable designers and Councils to assess commercial buildings with the view to reducing their environmental impact. The environmental issues covered by the Scorecard include the following:

1. Energy Efficiency.
2. Transport.
3. Water.
4. Waste.
5. Materials.
6. Indoor Environment Quality.
7. Innovation.

SDS Non-Residential requires a building to achieve a minimum score for each environmental issue. A high score under one environmental issue cannot be used as an offset for a low score in another environmental issue. The scorecard is aimed at minimum performance requirements and uses both proscriptive and performance criteria. The Energy Efficiency category requires that a minimum of 30 points be achieved (Howard et al. 2007). Points can be received for the following:

- ABGR ratings of 3 Stars for retrofits and 4 Stars for new-builds (30).
- Energy Star Ratings for water heating systems (up to 8.8).
- Insulation in accordance with the BCA (2).
- Percentage high performance glazing (up to 4).
- Cooling system efficiency (up to 10).
- Heating system efficiency (up to 10).
- HVAC/Zoning (2).
- Lighting W/m^2 (up to 6).
- Predicted energy improvements on BCA requirements of 20% (3).
- Energy efficient ventilation in car parks (up to 4).
- Electrical sub-metering (1).
- On-site renewable electricity generation (up to 10).

The SDS Non-Residential algorithms, assessment methodology and spreadsheet framework were developed for the City of Port Phillip and Moreland City Council by GHD Pty Ltd. RMIT Centre for Design provided the scores for the building materials impact.

Suitability for Mandatory Disclosure

Building sustainability rating tools are ideal for promoting best practice in building design from a holistic environmental perspective. They may also be used to enforce minimum standards for building sustainability and provide options for reducing greenhouse gas emissions at least cost, rather than working through proxy measures like thermal loads (Howard et al. 2007). However, in terms of a mandatory disclosure regime for commercial

building energy efficiency, they are inappropriate because they do not singularly assess and rate building energy efficiency.

2.1.5 AVAILABILITY OF TRAINED ASSESSORS

The tools available for rating the energy efficiency of commercial buildings are relatively complex. Suitably qualified and trained assessors are, therefore, essential to ensuring that outputs are consistent and accurate.

Since the introduction of the energy efficiency provisions for commercial buildings in the BCA, the number of users of energy analysis software has grown significantly. Training in the use of energy analysis software is available through the suppliers of the software and more broadly through industry associations such as the Australian Institute of Refrigeration Air Conditioning and Heating. As previously mentioned, the ABGR scheme is also underpinned by a scheme for the training and accreditation of assessors.

The introduction of a mandatory disclosure scheme for commercial buildings will further increase demand for suitably qualified and trained assessors. There may also be a need to introduce an accreditation system in order to ensure that the scheme is appropriately underpinned by competent assessors.

2.1.6 ENERGY DATA AVAILABILITY

Accurate rating of the energy efficiency of commercial buildings is also contingent upon the availability of energy consumption data and associated information. This, in turn, is dependent upon whether the tenancies within buildings are separately metered.

For buildings that have been fully occupied for a sufficient length of time (e.g. 12 months), and have sufficient energy metering, actual energy consumption data may be used to rate the energy efficiency of the building (as per the ABGR scheme described above). However, for buildings that have not been occupied for a sufficient length of time, or lack sufficient metering, a method of predicting the energy efficiency of the building is required.

With recent advances in computer technology, energy data meters have become increasingly sophisticated while also becoming less expensive and easier to install. Meters can now be relatively easily installed within both new and existing buildings.

Energy data meters are being used to a much greater extent within both new and existing commercial buildings. This demand is being driven, in part, by government regulations and polices such as the Energy Efficiency in Government Operations (EEGO) policy. There are also a growing proportion of astute commercial building operators who are aware of the benefits to be obtained from having accurate energy data.

2.2 ADMINISTRATIVE CONSIDERATIONS

An effective disclosure regime must be underpinned by an administrative framework that supports the technical processes. In broad terms, the administration of the mandatory disclosure regime should aim to work towards ensuring the following outcomes:

- **Transparency:** Full disclosure of the processes, procedures, and assumptions in report preparation are essential to the scheme's credibility. Tools that assess the energy

efficiency of commercial buildings need to be used with a high level of confidence by accredited users to facilitate market certainty.

- **Inclusiveness:** The administrative body must regularly engage its stakeholders to help focus and continually enhance the quality of reports. Unrealistic and complicated reporting arrangements need to be avoided.
- **Auditability:** Reported data and information should be recorded, compiled, analysed, and disclosed in a way that would enable internal auditors or external assurance providers to attest to its reliability.
- **Completeness:** All information for assessing and reporting a building's energy efficiency should be disclosed in a consistent format.
- **Accuracy:** Energy efficiency assessments must achieve a high degree of accuracy and be correctly reported in order for users to make decisions based on this information with a high degree of confidence.
- **Neutrality:** Audits for quality control of energy efficiency assessments should be carried out by respected, independent auditors without bias towards any particular stakeholder.
- **Comparability:** The reporting process should allow for comparability through clearly laid out information on the energy efficiency of buildings. Electronic storage of this information will allow the evaluation of trends in energy efficiency across different jurisdictions and building classifications.
- **Clarity:** The administrative body and assessors should remain cognisant of the diverse needs and backgrounds of their stakeholders and make information available in a manner that is clear with a suitable level of detail.
- **Timeliness:** Assessments should be able to be carried out in a manner that accommodates the timeframes of users.
- **Acceptability:** The disclosure regime needs to be collectively supported by the marketplace. This requires continuous engagement with stakeholders throughout the development and implementation processes.

To achieve these outcomes, an administrative body needs to be established to oversee the implementation and ongoing development of the mandatory disclosure regime. Ideally, this would consist of one national body, although it could be undertaken within each jurisdiction.

The key functions of the administrative body are likely to include the following:

a) Managing energy data collection and validation processes.
b) Developing and reviewing assessment tools and energy efficiency benchmarks.
c) Training and accrediting assessors.
d) Maintaining a register of accredited assessors.
e) Implementing auditing and quality assurance processes.
f) Facilitating stakeholder communication and feedback.
g) Undertaking regular reviews of the scheme.

The legal considerations for the administration of a national regime for the mandatory disclosure of commercial building energy efficiency are detailed in Section 6.

2.3 SUMMARY OF TECHNICAL AND ADMINISTRATIVE CONSIDERATIONS

Rating the energy efficiency of commercial buildings for disclosure purposes is extremely complex. The issues that affect the technical capacity to rate the energy efficiency of

commercial buildings include the size, nature and diversity of commercial buildings, the different leasing arrangements, the availability of sufficient energy data, suitable tools and trained assessors.

While energy analysis software is available for predicting the theoretical annual energy consumption of commercial building, the only tool that adequately benchmarks the actual energy efficiency of commercial buildings is the ABGR scheme. A major drawback of this scheme is that it only rates office buildings. If a disclosure scheme were to be introduced to cover all types of commercial buildings, an assessment tool would need to be developed for Class 3, 6, 7, 8 and 9 buildings.

Verification Method JV3 of the BCA could be used to benchmark the energy efficiency of a wider range of commercial buildings. However, this would require the development of an accurate method for correlating the predicted and actual level of energy efficiency.

As an alternative to the ABGR scheme, a proposed methodology for the establishment of a disclosure scheme is detailed in Appendices B, C and D. This methodology has been designed to facilitate the development of assessment tools and energy efficiency benchmarks for all commercial building types. The scheme caters for either basic or detailed disclosure of the energy efficiency of buildings depending upon the availability of energy data across the sector of a particular building type.

A mandatory disclosure regime must be underpinned by an administrative framework that supports the technical processes. In this regard, an administrative body needs to be established to oversee the implementation and ongoing development of the regime. In broad terms, the administrative body would be responsible for maintaining the credibility and long term viability of the regime.

3 INTERNATIONAL REGIMES

There are many international regimes that have been implemented in order to improve the energy efficiency of commercial buildings. Although there are some common projects involving several EU members exchanging ideas, most countries seem to be developing implementation methods according to their existing systems and laws as appropriate to their local conditions (AGO 2005 p.6).

Some of the more significant initiatives are summarised below.

3.1 EUROPEAN UNION

The majority of European governments are influenced by the European Union (EU) Directive on the Energy Performance of Buildings (2002/91/EC). The Directive's aim is to provide a framework for improving the energy efficiency of new and existing buildings for member states. It is also intended that this framework will assist the EU to meet its climate change objectives under the Kyoto Protocol.

The components of the Directive include:

- A methodology for calculating the energy performance of buildings.
- The application of performance standards on new and existing buildings.
- A certification scheme for all buildings, known as Energy Performance Labels (EPLabels) which is a form of mandatory disclosure.
- Regular inspection and assessment of boilers/heating and cooling installations.

European jurisdictions are encouraged through this directive to provide some form of information about the energy efficiency of buildings to prospective tenants or purchasers (EPLabels). However, this provision is to be accompanied by voluntary schemes that provide program funding and/or tax incentives at the point of refurbishment to those owners willing to improve the energy efficiency of their buildings. Governments typically require an assessment of the energy use in a building based on Government approved assessment software and then offer program funding and/or tax incentives according to what can be done in a building and/or what the owner is willing to pay. The energy information on the EPLabel is to be made available to the prospective tenants or purchasers and, in some cases, to the public (refer Appendix E for an example certificate).

3.1.1 DENMARK

There is some use of EPLabelling in Denmark. Denmark uses a fixed time period for each assessment rather than doing one at a transaction point (i.e. sale or lease). For example, an assessment is carried out once every five years on every building over a certain size, and every ten years under a certain size. Assessments were originally carried out annually, but this was found to be onerous. In addition, it was found that the characteristics of buildings do not vary greatly over one year (Department of Energy and Environment, Denmark 2007).

Incentives provided by Demark are not consistent and vary from year to year. In the main, Denmark relies on its utilities to encourage energy efficiency but the programs change on a regular basis.

3.1.2 UNITED KINGDOM

The United Kingdom (UK) closely adheres to the targets and strategies set by the EU. The UK has in place financial incentives, emissions targets and corresponding tax incentives, as well as a scheme for the provision of information and advice to industry. There are multiple programs aimed at lowering the greenhouse gas emissions of commercial buildings. There are also plans for staged implementation of the EPLabelling system (in the form of Energy Performance Certificates and Display Energy Certificates) over the next three years (Department for Environment Food and Rural Affairs, England 2003).

Energy Performance Certificates (EPC) cover all buildings, other than public buildings, and will be required whenever a building is constructed, rented or sold. The certificate will provide a rating of the energy efficiency and carbon emissions of a building from A to G, where A is very efficient and G is very inefficient.

The EPC must show the 'asset rating' of the building, which is a numerical indicator of the amount of energy estimated to meet the different needs associated with a standardised use of the building. The process requires sellers and prospective landlords to make available an EPC of the property to prospective buyers and tenants at the earliest opportunity. This does not have to be done where the seller or landlord has reasonable grounds to believe that the prospective buyer or tenant cannot afford or is not serious about the transaction. In cases where the EPCs have been made available in ways which did not involve providing a copy of the EPC, the seller or prospective landlord must ensure that a copy is provided to the ultimate buyer or tenant.

EPCs are produced using standard methods with standard assumptions about energy usage so that the energy efficiency of one building can easily be compared with another building of the same type. This allows prospective buyers, tenants, owners, occupiers and purchasers to see information on the energy efficiency and carbon emissions from their building and thereby consider the energy efficiency related costs of their investment.

An EPC is accompanied by a report that lists cost-effective and other measures to improve the energy rating of the building, such as low and zero carbon generating systems. The certificate is also accompanied by information about the higher rating that could be achieved if all the recommendations were implemented.

Display Energy Certificates (DECs) cover public buildings and show the actual energy use and efficiency of the building (i.e. operational rating) to the public. The operational rating is based on the energy consumption of the building as recorded by gas, electricity and other meters. The DEC should be clearly displayed at all times in a prominent place that is clearly visible to the public. A DEC is accompanied by an advisory report that lists cost-effective measures to improve the energy rating of the building.

DECs are only required for buildings over 1000 m^2 that are occupied by a public authority or are institutions providing public services. DECs are valid for one year and the accompanying advisory report is valid for 7 years.

There are a number of other UK programs aimed at reducing greenhouse gas emissions from the commercial building sector (Department for Environment Food and Rural Affairs, England 2003). The Climate Change Levy is a tax on the use of energy in industry, commerce and the public sector, with offsetting cuts in employers' National Insurance Contributions and additional support for energy efficiency schemes and the use of renewable

sources of energy. The Carbon Reduction Commitment is a new scheme that will apply mandatory emissions trading to cut carbon emissions from large commercial and public sector organisations (including supermarkets, hotel chains, government departments, large local authority buildings) by 1.1 MtC/year by 2020. Emissions trading is a key part of the long-term solution to greenhouse gas emissions in the UK strategy. The Carbon Trust, a government funded body, has also been established to assist carbon emissions reduction in non-domestic buildings in the UK (Carbon Trust 2007).

Other European countries are also well advanced in their commercial building incentives for reducing greenhouse gas emissions, however, none have implemented the EPLabelling system to date.

3.2 CANADA

Canada's Office of Energy Efficiency (OEE), part of Natural Resources Canada, offers the ecoENERGY Retrofit Incentive for Buildings. Under the scheme, new energy efficiency projects are able to receive up to 25% of eligible project costs with $10 per gigajoule of energy saved per year (Office of Energy Efficiency, Natural Resources Canada 2007).

Rebates are obtainable with the proviso that an independent energy assessment is carried out up-front to determine the benchmark for the building. A final assessment is required to ensure that the planned changes have achieved the energy improvements initially sought.

Canada’s building energy use assessment is mainly carried out through surveys and relies on voluntary reporting. Statistics Canada, Canada’s central data collection agency, collects most of the information for the OEE. The OEE also relies on associations who report directly to the OEE, as well as private agencies that collect data.

A committee comprised of energy experts and policy makers from around Canada has recently investigated the possible introduction of a national building energy labelling program to assess the energy performance of commercial, institutional and government buildings and to report this performance through some sort of certificate, label, plaque or combination thereof. Plans for a series of pilot projects aimed at evaluating a draft version of this label, as well as a number of program delivery options, are being formulated.

Due to the ‘confederation’ of provinces in Canada, the federal government’s powers are limited in certain areas, including the management of resources. For example, the federal government has no power to ‘mandate’ building labelling (or other forms of energy information disclosure) so participation in a national-level labelling program would be on a voluntary basis. Individual provinces, however, could make this kind of labelling mandatory and a national framework could be developed to provide consistent policy across the provinces.

Each province also has its own incentive schemes which are independent to the national schemes. Manitoba and British Columbia were selected as examples as they have particularly diverse and thorough schemes.

3.2.1 MANITOBA

Manitoba has well developed schemes that target specific energy issues in buildings, such as insulation, heating and cooling units, as well as provide loans for energy efficiency upgrades

(e.g. Energy Performance Contracts). Other solutions are also available for lighting and alternate sources of energy such geo-thermal heat pumps (Manitoba Hydro 2005).

Mandatory disclosure is not currently in Manitoba, however, assessments will be done for a building to determine its energy use and identify where improvements can be made when an owner chooses to get involved in a scheme funded by the province.

3.2.2 BRITISH COLUMBIA

British Columbia is similar to Manitoba in that it also has a series of incentives to assist commercial building owners to implement energy saving programs. Again, mandatory disclosure is not used in British Columbia (British Columbia Hydro 2007).

3.3 USA

There is no mandatory disclosure at the federal level in the USA. Instead, the focus is on tax incentives (U.S. Department of Energy 2007).

The *Energy Policy Act of 2005* includes a tax deduction for investments in 'energy-efficient commercial building property' that is designed to significantly reduce the heating, cooling, water heating and interior lighting energy cost of new or existing commercial buildings. The deduction is limited to $1.80 per square foot (roughly $18.00 per square meter) of the property, with allowances for partial deductions for improvements in interior lighting, building envelope systems, HVAC and hot water systems. To qualify for the full deduction, a building owner or tenant must make investments designed to reduce energy costs by 50% or more. A partial deduction of $0.60 per square foot is available for investments in one of three systems: lighting; heating and cooling; or building envelope, which are designed to reduce energy costs by 16.66 % (one-third of the 50% requirement).

To apply for a tax deduction, one of the software tools approved by the Department of Energy must be used to demonstrate the level of efficiency attained.

3.4 JAPAN

Companies in Japan are required to prepare plans and implement energy management strategies on their own initiative. Periodic reports on the actual status of their energy consumption are required to be submitted under 'the Act Concerning the Rational Use of Energy', as well as medium and long-term plans for energy conservation activities. This form of mandatory disclosure is part of Japan's endeavour to reduce greenhouse gas emissions and save energy (Ministry of Economy, Trade and Industry, Japan 2006).

When refurbishing a commercial building it is compulsory to submit notification of energy-saving measures to the relevant authorities for buildings with a total floor area of 2,000 square meters or more.

The owner is also required to submit an 'overall maintenance status report' every three years. The report covers building maintenance issues, such as the state of repair of air-conditioning and hot water services, as well as equipment and window cleaning. When the relevant building official or private building inspector finds that the status is extremely inadequate, compared to the prescribed standard, they may issue some recommendations or instructions to

improve the efficiency. They may also disclose the owner's name to the public as a punishment if the owner does not follow the instruction.

Changes to tax credits and special deduction criteria have been introduced to promote the purchase of energy efficient plant and equipment. These include highly efficient industrial furnaces, co-generation facilities, hybrid cars, light-emitting diode lighting equipment, highly efficient air-conditioning equipment (e.g. a multi-central system), highly insulated window glass and transformers.

Japan has other policies such as Coolbiz, which is a relaxation of the formal business attire in the summer months to reduce air-conditioning use in office buildings. Under this scheme, people are encouraged to not wear a tie or jacket and to dress more casually.

3.5 SUMMARY OF INTERNATIONAL REGIMES

Internationally, there is a variety of approaches to improving the energy efficiency of commercial buildings. The common theme among jurisdictions is that government incentives for refurbishments and upgrades are favoured.

Some form of energy efficiency disclosure exists in most jurisdictions because energy efficiency information is required to receive incentives. However, few jurisdictions have implemented mandatory disclosure for commercial buildings.

The UK has a well defined mandatory disclosure scheme, which is based on EU's certification scheme, EPLabel. The scheme is due for a staged implementation over the next three years. For most commercial buildings, an EPC is required whenever a building is constructed, rented or sold. The certificate will provide a rating of the energy efficiency and carbon emissions of a building from A to G, where A is very efficient and G is very inefficient.

4 BASIC MANDATORY DISCLOSURE REGIME

A national regime for the mandatory disclosure of commercial building energy efficiency could be developed into a number of different forms. However, for the remainder of this report a basic mandatory disclosure regime will be examined which reflects a general assessment of the considerations highlighted above. This assumes that it would be most effective for disclosure to occur at both the point of sale and lease, and that a means of rating energy efficiency will be developed for all types of commercial buildings.

Under the basic mandatory disclosure regime, the energy efficiency of all whole buildings (for sale) and tenancies (for lease) over 2000 m^2 would be required to be publicly disclosed by the vendor or landlord when the property becomes available for sale or lease. Where a tenancy exceeds 50% of the net lettable area of the whole building, the energy efficiency of the base building (structure and central services) would also need to be disclosed.

5 ALTERNATIVE MEASURES

In addition to a mandatory disclosure regime, improvement in the energy efficiency of commercial buildings can be facilitated through a wide variety of measures.

In a strong regulatory environment, a higher level of energy efficiency could simply be enforced through the BCA. The current provisions for Class 5 to 9 buildings were found to have benefit to cost ratio of 4.9 (ABCB 2006b), indicating that there is considerable scope to enhance these provisions while still maintaining a comfortable payback period. However, the BCA generally only captures new building work, except where the proportion of new work on an existing building exceeds a certain threshold (typically 50 per cent of floor area depending upon the applicable state or territory legislation).

As previously discussed, the intent of disclosure is to complement the BCA provisions with a regime that provides incentive or encouragement to improve the energy efficiency of a building. It is also intended to ensure that existing building stock are captured by a regime. For this reason, enhancement of the BCA provisions will not be examined any further. Instead, three alternative measures which achieve a similar intent to disclosure will be examined.

There are many alternative measures that could be examined in this report. However, rather than complete an exhaustive review of alternatives, three specific alternative measures will be examined in the remainder of this report. These alternatives were chosen for a number of reasons, in particular, to provide insight into some of the diverse policy options available. Some of the alternatives have been identified through stakeholder consultation. They are also considered to provide a reasonable representation of alternatives that will challenge the basic approach to disclosure.

5.1 ENHANCED DUE DILIGENCE

Most major property acquisitions involve due diligence investigations, normally by the legal representative of the potential purchaser or lessee. Due diligence investigations are intended to identify issues that can affect the outcome of a transaction. For commercial property transactions, this may include investigation into the structural adequacy, regulatory compliance and general condition of the building.

It is feasible to extend due diligence investigations to include the level of energy efficiency of commercial buildings. This would have a similar outcome to a basic disclosure regime except that the disclosure itself would be limited to the purchaser or lessee—not to the public.

Like any form of disclosure, a drawback to this measure is the lack of tools for benchmarking the energy efficiency of other than office commercial buildings. This means that landlords and tenants of other than office commercial buildings have no readily available means of determining whether the building has operated, or has the potential to operate, efficiently.

Putting aside this issue of benchmarking, further examination of the measure in this report will focus on due diligence processes associated with the purchase or lease of commercial properties greater than 2000 m^2.

5.2 GREEN LEASE SCHEDULE

The *Energy Efficiency in Government Operations* (EEGO) policy requires Australian Government operated office buildings over 2000 m^2 to achieve a level of energy efficiency equivalent to 4.5 stars under the ABGR scheme (AGO 2006a). It also requires lease agreements to include a GLS containing the following five key elements:

1. Establishment of the ABGR to be achieved throughout the lease period.

2. The installation of on-market status digital sub-metering to provide accurate data on the energy being consumed by each key building element.

3. The inclusion of an energy management plan (EMP) that details the technical requirements designed to ensure that the building achieves the agreed ABGR.

4. The formation of a building management committee that comprises of owner and tenant representatives which is responsible for the regular review of energy data and the proper implementation of the EMP.

5. Remedial action and dispute resolution processes.

The GLS establishes legal agreement between the landlord and tenant on the level of energy efficiency to be maintained throughout the lease period so as to overcome split incentive and information asymmetry issues.

While the EEGO policy encourages the attainment of 4.5 stars under the ABGR scheme, a GLS can be established at any level of energy efficiency and is not bound to the ABGR scheme. Importantly, the GLS provides a practical framework for ensuring that the agreed level of energy efficiency is achieved each year.

Under NFEE Stage Two, the State and Territory Governments have also agreed to develop and implement GLS for their office buildings.

It is possible to extend the GLS concept (i.e. develop a generic GLS) to cover all commercial tenancies. This would act as a form of disclosure because the establishment of a GLS requires the level of energy efficiency, or ABGR, to be investigated and agreed upon by the landlord and tenant. However, like disclosure and the enhanced due diligence measure, a drawback to this measure is the lack of tools for benchmarking the level of energy efficiency of other than office commercial buildings.

Putting aside this issue of benchmarking, further examination of the measure in this report will focus on the transaction of commercial tenancies of greater than 2000 m^2 and greater than two years duration.

5.3 ACCELERATED DEPRECIATION

Tax incentives could be used to stimulate investment into improving the energy efficiency of commercial buildings. In this regard, accelerated depreciation could be utilised to enable building owners to recoup direct expenditure on energy efficiency improvements more expediently than would be possible through normal taxation rules for depreciation. In effect, accelerated depreciation provides a subsidy for energy efficiency improvements. However,

this does not lead to the disclosure of commercial building energy efficiency, except as may be required to substantiate a claim for accelerated depreciation.

There are a number of complexities to administering a scheme of accelerated depreciation. Importantly, accelerated depreciation should only apply to energy efficiency improvements over and above business-as-usual improvements to a building. Distinguishing between expenditure that relates to energy efficiency improvement as opposed to business-as-usual expenditure is not always likely to be straightforward and will complicate the administration of such a scheme. An added complication is the lack of tools available for benchmarking the level of energy efficiency improvement in other than office buildings. While the ABGR scheme can be used to verify that a substantial level of energy efficiency improvement has been achieved in an office building, as previously discussed, no such benchmarking tool exists for other types of commercial buildings.

Putting aside these issues, further examination of accelerated depreciation in this report will focus on a scheme that would enable the depreciation of energy efficiency improvements that result in greater than 30% improvement in energy efficiency. The rate of depreciation would be half that normally allowed for improvements to commercial buildings.

Notwithstanding the above, a subsidy scheme could be introduced in lieu of accelerated depreciation. This would provide a similar stimulus to investment in energy efficiency improvements. The subsidies would be administered by a government agency and provided from a pool of funds to commercial building projects that result in demonstrated improvements in energy efficiency.

5.4 BASIC COMPARISON OF MEASURES

A comparison of the basic characteristics of each measure is shown in Table 5.4.

Table 5.4 Basic Comparison of Measures

MEASURE	AFFECTED BUILDINGS	POINT OF DISCLOSURE	NATURE OF DISCLOSURE
BASIC DISCLOSURE REGIME	EXISTING > 2000 m^2	PURCHASE OR LEASE	VENDOR/LANDLORD TO PUBLIC
ENHANCED DUE DILIGENCE	EXISTING > 2000 m^2	PURCHASE OR LEASE	VENDOR/LANDLORD TO PURCHASER/TENANT
GREEN LEASE SCHEDULE	EXISTING > 2000 m^2	LEASE	LANDLORD TO TENANT
ACCELERATED DEPRECIATION	NEW AND EXISTING	N/A*	N/A*

* The energy efficiency of the building may need to be assessed and disclosed to the Australian Taxation Office in order to substantiate a claim for accelerated depreciation.

6 LEGAL CONSIDERATIONS (AUSTRALIAN GOVERNMENT SOLICITOR)

6.1 SCOPE

The legal issues arising from the following questions have been addressed:

a) What legal instruments would need to be amended in each State and Territory to incorporate a requirement for commercial property owners to disclose the energy efficiency of their buildings to potential lessees or purchasers?
b) Is it possible to mandate and/or enhance disclosure to potential lessees or purchasers as part of the due diligence process in a lease or sale transaction?
c) Is it possible to mandate the use of elements of the GLS in all commercial leasing transactions and how would this be achieved?

The focus in the legal considerations for this report is on the legislative options for 'disclosure' rather than on legislation to mandate prescribed performance levels. However, this is touched on briefly in the context of the discussion about mandating elements of the GLS.

Consideration of the issues of a technical, practical, operational or economic nature is not included within the scope of the legal considerations.

In order to address the legal considerations, the constitutional powers of the Commonwealth of Australia (Commonwealth) to legislate for mandatory disclosure have been considered.

6.2 CONSTITUTIONAL ISSUES

Is there constitutional power to enact legislation requiring mandatory disclosure of energy efficiency ratings for commercial property sales and leasing?

It is considered that the Commonwealth Parliament could enact legislation which would meet the objectives of the mandatory disclosure scheme proposal to a significant extent under the authority of the corporations power in s51(xx) of the Constitution, supplemented by the Territories power in s122 and the incidental power in s51(xxxix).

Legislation enacted under these powers would cover the majority of commercial property sale and lease transactions which occur in Australia. However, there would be some commercial property sale and lease transactions which would not be captured by such a scheme. For example, transactions in which a retail sole-trader leases retail space in a State-owned hospital or university, or in which a legal partnership leases office space to an accounting partnership, may not be captured.

Alternatively, the Commonwealth could use the taxation power in s51(ii) to establish a disclosure scheme based on taxation disincentives for non-disclosure, or seek a referral from the States to enact uniform legislation (s51xxxvii).

There may also be some scope for using the external affairs power in s51(xxix). The Office of International Law in the Attorney-General's Department should be consulted in relation to this issue.

6.2.1 CONSTITUTIONAL CONSIDERATIONS

Constitutional power to legislate to establish a mandatory scheme for energy efficiency ratings disclosure in commercial property sales and leasing transactions

The Commonwealth does not have a general power to legislate commercial property sale or lease transactions, energy efficiency, or environmental issues more broadly. However, various constitutional powers could be relied upon to support legislation dealing with such matters in particular contexts. A discussion of specific constitutional powers appears below.

CORPORATIONS POWER

Under s51(xx) of the Constitution, the Commonwealth Parliament has power to make laws with respect to 'foreign corporations, and trading or financial corporations formed within the limits of the Commonwealth'. (These corporations will be referred to as 'constitutional corporations' and s51(xx) as the 'corporations power'.) This is a very broad power and is likely to be useful for the mandatory disclosure proposal.

In order to consider the scope of the corporations power, it is necessary to consider, firstly, the nature of the entities which may be regulated using that power (i.e. what entities are 'constitutional corporations'), and secondly, the kinds of activities and transactions involving these entities that may be regulated using corporations power.

6.2.2 ENTITIES THAT ARE CONSTITUTIONAL CORPORATIONS

Constitutional corporations are 'foreign corporations' and 'trading and financial corporations formed within the limits of the Commonwealth'.

FOREIGN CORPORATIONS

Foreign corporations, for the purposes of s51(xx), are corporations established outside Australia. So, for example, a corporation formed under United States law, but carrying on business in Australia, could be the subject of legislation under s51(xx).

TRADING CORPORATIONS

The courts take a broad view of what may fall within the concept of 'trading'. Existing High Court authority indicates that whether a corporation is a trading corporation depends on whether its trading activities are a substantial or significant part of its overall current activities. It is not a requirement that trading be the sole, predominant or principal activity. If, however, the trading activities are slight and incidental to some other principal activity, then the corporation will not be a trading corporation. In other words, the question of whether a given corporation is a trading corporation is a question of fact and degree.

FINANCIAL CORPORATIONS

Similarly, if financial activities (e.g. borrowing and lending money) are a substantial or significant part of a corporation's overall current activities, it is a financial corporation. A corporation may, at the same time, be both a trading and a financial corporation.

In practice, constitutional corporations are likely to comprise a significant proportion of all entities engaging in commercial property transactions in Australia. For example, it is considered that the following would be trading or financial constitutional corporations (provided that the relevant entities are incorporated - see our discussion below on 'Bodies which are not incorporated'):

- Wholesale and retail trade entities including supermarkets, shopping malls and department stores.
- Construction entities.
- Property and business service entities such as commercial property operators and developers and car hire companies.
- Large hotels and hotel chains.
- Transport (road, passenger, rail and air) and storage entities.
- Communication services including postal, courier and telecommunications services.
- Mining entities.
- Mining services such as exploration.
- Manufacturing entities.
- Electricity, gas and water supply, sewerage and drainage entities.
- Other business services such as legal, accounting, computer and marketing.
- Agriculture, forestry and fishing businesses.
- Finance and insurance entities such as banks.

6.2.3 ENTITIES THAT ARE NOT CONSTITUTIONAL CORPORATIONS

BODIES THAT ARE NOT INCORPORATED

Bodies that are not incorporated will not be constitutional corporations. For example, unincorporated associations, individuals and most partnerships are not incorporated and so are not within the reach of the corporations power. Similarly, State authorities which are not established as bodies corporate would not be covered.

Certain forms of business services providers, such as legal services, accounting and consultancy services providers are frequently organised as partnerships rather than corporations. Such entities would not be constitutional corporations.

Public preschools, primary and secondary schools are unlikely to be incorporated and, hence, will not be constitutional corporations. In addition, while it is likely that the majority of hospitals will be incorporated, some public hospitals, hospitals run by charitable or religious organisations and some other community services providers will not be incorporated and, so, will not be constitutional corporations.

INCORPORATED BODIES THAT ARE NOT TRADING OR FINANCIAL CORPORATIONS

It is unclear as to whether all incorporated educational entities, incorporated health and community services (such as hospitals), and incorporated cultural and recreational services, will qualify as trading and financial corporations. It would be necessary to consider the activities of each institution to determine whether its trading or financial activities are a substantial or significant part of its overall current activities. In general, however, it seems that privately owned incorporated educational institutions and health providers are more likely to be trading corporations, while government owned entities are less likely to be. Similarly, incorporated cultural and recreational services that operate for profit, such as commercial television and radio stations and the TAB, or publicly owned television and radio stations that include advertising (such as SBS) will be likely to satisfy the activities test and be classified as trading corporations. However, the situation is less clear in the context of entirely publicly funded television and radio stations.

Some caution should, therefore, be exercised when considering whether to rely on the corporations power to regulate the types of corporations discussed in the paragraph above.

6.2.4 ACTIVITIES THAT MAY BE REGULATED USING THE CORPORATIONS POWER

The broad scope of activities which may be regulated by the corporations power was recently confirmed by the High Court. It includes the regulation of the activities, functions, relationships and the business of a corporation described in that subsection. It also includes the creation of rights and privileges belonging to such a corporation, the imposition of obligations on it and, in respect of those matters, to the regulation of the conduct of those through whom it acts, as well as its employees and shareholders. The regulation of those whose conduct is or is capable of affecting its activities, functions, relationships or businesses is also captured by the corporations power.

It is considered that under the corporations power, the Commonwealth would have the power to enact legislation requiring constitutional corporations to disclose energy efficiency information about commercial properties which the entity wishes to sell or lease to another entity. Furthermore, the corporations power would support a law prohibiting a constitutional corporation from entering into an arrangement to lease or purchase commercial property from another entity (even if that entity was not a constitutional corporation) where the other entity has not disclosed the relevant energy efficiency information to the constitutional corporation. In other words, provided at least one of the parties to a sale or lease was a constitutional corporation, the Commonwealth could legislate to require disclosure of energy efficiency ratings of commercial buildings in the context of the sale or lease transaction.

It seems reasonable to assume that in a significant majority of cases at least one party to a commercial property sale or lease transaction will be a constitutional corporation. The corporations power would, therefore, be a significant source of Commonwealth power to enact the proposed legislation. However, as noted above, there are some entities which are not ‘constitutional corporations’ and transactions between these entities would not be able to be regulated under the corporations power.

TERRITORIES POWER

The Territories power in s122 of the Constitution enables the Commonwealth Parliament to legislate for the government of any Territory. That power would enable the Commonwealth to enact legislation governing energy efficiency ratings standards and disclosure requirements in relation to places, persons or activities in the Territories. For example, legislation could be enacted prohibiting the entering into of a commercial lease or sale agreement in the Territories unless specified energy efficiency disclosure has taken place between the parties. This would apply to all such transactions, regardless of whether the parties to the transactions were constitutional corporations.

TRADE AND COMMERCE POWER

Under s51(i) of the Constitution, the Commonwealth Parliament has power to enact legislation regarding 'trade and commerce with other countries, and among the States', that is, trade and commerce which is interstate or international.

There is some doubt that the scope of this power would extend to transactions where one party is in one state and the other in another state (or country), but where the transacted property does not pass over the state borders. The types of transactions that would be covered by the proposed disclosure scheme would appear to generally fall within this category of transactions. That is, while the parties to a sale or lease may be located in different states (or one in Australia and one outside of Australia), the property which is sold or leased will remain in the one location.

Relevantly, the Solicitor General, David Bennett QC, has expressed the view that a contract between persons in different states that does not involve an interstate movement of goods, persons or things may not be a part of interstate trade or commerce, even if contract negotiations may involve travel or communication across state borders. In that situation, although the relevant travel or communication is likely to constitute interstate trade or commerce, it will not necessarily mean that the resulting contract itself forms part of interstate trade or commerce. At present it is considered that, in relation to the present proposal, it would not be possible to rely on the trade and commerce power to enact the proposed legislation.

EXTERNAL AFFAIRS POWER

The external affairs power (s51(xxix)) allows the Commonwealth Parliament to enact laws with respect to the implementation of Australia's obligations under treaties and other international instruments.

Australia is a party to the United Nations Framework Convention on Climate Change. There may be some scope for relying on this Convention to support the use of the external affairs power to enact the proposed legislation. However, an analysis of the terms of the Convention would be necessary to determine whether it would support legislation such as that which is proposed. In particular, it would be necessary to identify a link between the legislation and the objectives of the Convention. The Office of International Law in the Attorney-General's Department would also need to be consulted in relation to any proposal to use the external affairs power as a constitutional basis for the proposed legislation.

TAXATION POWER

Although the current proposal does not include the use of financial incentives to implement the mandatory disclosure scheme, there may be some scope for this under the taxation power in the Constitution (s51(ii)). For example, Commonwealth legislation could be introduced imposing tax disincentives (such as levies) on lease or sale transactions that have not had an energy efficiency rating disclosure. Such a scheme could be modelled on the Superannuation Guarantee legislation that provides a financial disincentive (in the form of a tax) on employers who do not meet the specified superannuation contribution level of their employees. Such a tax could be imposed on all commercial property transactions, regardless of the parties to, or location of, the transaction. However, a law made under this power could only encourage compliance (by making it financially desirable) rather than requiring compliance.

REFERRAL OF POWER BY THE STATES

Under s51(xxxvii) of the Constitution, the States can refer their legislative power on a particular subject-matter to the Commonwealth. The Commonwealth then has power to legislate on those matters, although the Commonwealth law can extend only to States 'by whose Parliaments the matter is referred or which afterwards adopt the law'. Accordingly, all the States could refer appropriate powers to the Commonwealth in relation to energy efficiency disclosure in the context of commercial property transactions. Then, together with the Territories power, the Commonwealth Parliament would have power to pass legislation comprehensively regulating energy efficiency disclosure requirements for all commercial property sale and leasing transactions, whether or not the parties to the transactions are constitutional corporations, unincorporated associations, individuals or the like.

As a practical matter, however, it is unusual for the States to agree to refer powers to the Commonwealth, although, if there was a high level of agreement between the States and the Commonwealth, this may be preferable to the States each amending their own legislation.

REGULATION OF THE COMMONWEALTH'S OWN ACTIVITIES

The 'incidental power' in s51(xxxix) is a power to enact laws with respect to:

> [M]atters incidental to the execution of any power vested by this Constitution in the Parliament … or in the Government of the Commonwealth … or in any department or officer of the Commonwealth.

This power is capable of supporting laws regulating the conduct of Commonwealth affairs, including, for example, laws requiring Commonwealth entities to participate in an energy efficiency disclosure scheme regarding the sales and leases of commercial property. For example, the Commonwealth could rely on this power to require the Commonwealth, and Commonwealth authorities, to disclose energy efficiency information to entities that have leased or bought property from the Commonwealth. This power could also be relied upon to require entities that seek to lease or sell property to the Commonwealth to disclosure energy efficiency ratings in those transactions.

6.2.5 LIMITATIONS ON COMMONWEALTH POWERS

The Commonwealth's legislative powers are subject to express and implied constitutional limitations. For example, there are limitations on giving preference to one State, or part of a State, in the regulation of trade, commerce or revenue (s99), and also on the imposition of

discriminatory burdens of a protectionist kind on inter-State trade and commerce (s92). However, because the current proposal appears to involve uniform regulation of energy efficiency disclosure requirements throughout the States and Territories, it is unlikely that any of these constitutional limitations will pose any difficulty in enacting Commonwealth legislation to implement this proposal.

Another relevant limitation in legislation intended for State government owned enterprises (or other State government bodies) is the Melbourne Corporation principle (*Melbourne Corporation v Commonwealth* (1947) 74 CLR 31). The Melbourne Corporation principle is a constitutional limitation which prohibits the Commonwealth from enacting legislation that impermissibly restricts or burdens one or more of the States in the exercise of their constitutional powers. For this reason in the present context, it would be necessary to consider whether the law which required state government entities to disclose energy efficiency ratings might be beyond Commonwealth power.

A requirement imposed generally on entities that engage in commercial property transactions (such as sales and leasing) to provide energy efficiency ratings in property transactions (which entities may include State government business enterprises or other State government agencies) is unlikely to impermissibly burden State constitutional functions. The burden imposed on the States would be identical to the burden imposed on the general community. Further, such a disclosure requirement, although requiring the expenditure of resources, does not hinder the State's capacity to function as a government. Thus, the Melbourne Corporation principle may not prevent the Commonwealth from applying its energy efficiency disclosure scheme to State government owned enterprises (or other State government agencies) provided there is a constitutional power that supports the application of the disclosure scheme to the States in the first place, as discussed above.

ACQUISITION OF PROPERTY ISSUES

Section 51(xxxi) of the Constitution prevents the Commonwealth Parliament from enacting legislation that would affect an acquisition of the property of any person or State otherwise than on just terms. Although the present proposal affects activities which take place as part of property transactions, in our view the proposed legislation would not effect an acquisition of property from any person or State within the meaning of s51(xxxi) of the Constitution.

6.2.6 EXTENT OF COMMONWEALTH LEGISLATIVE POWER TO IMPLEMENT THIS PROPOSAL

In summary, the Commonwealth Parliament has legislative power to enact legislation which would meet the objectives of this proposal to quite a significant extent, in reliance on the corporations power in s51(xx), supplemented by the Territories power in s122 and the incidental power in s51(xxxix). However, some sale and lease transactions would not be captured by such a scheme. For example, a transaction in which a retail sole-trader leased retail space in a State-owned hospital or university may not be captured.

Alternatively, the Commonwealth could seek a referral from the States to enact uniform legislation (s51xxxvii) or use the taxation power in s51(ii) to establish a disclosure scheme based on taxation disincentives for non-disclosure.

Finally, it is noted that another option would be for the States and Territories to enact new uniform legislation (rather than merely amending existing legislation).

6.3 LEGAL INSTRUMENTS

What legal instruments would need to be amended in each State and Territory to incorporate a requirement for commercial property owners to disclose the energy efficiency of their buildings to potential lessees?

Given that classes of 'commercial buildings' are extremely wide and the option of amending existing State and Territory legislation is the least desirable option, our advice in this part is limited to commercial buildings that comprise office accommodation. Even within this limited scope it is clear that amendment of existing State and Territory legislation is extremely complex and would be a challenging undertaking.

The existing State and Territory mandatory disclosure frameworks are usually triggered by the sale or lease of the whole or part of the building, with some States and Territories also including disclosure regimes as part of strata subdivision legislation.

6.3.1 MANDATORY DISCLOSURE ON SALE

Regimes for the mandatory disclosure by the owner of property are established in Victoria, New South Wales, South Australia and Western Australia. The Northern Territory, Queensland and Western Australia have mandatory regimes for disclosure only in their strata subdivision legislation. The Northern Territory also has a non-mandatory regime contained in the precedent Contract of Sale approved by the Law Society. Tasmania has legislative provisions for mandatory disclosure but their commencement date has not yet been proclaimed.

The existing State and Territory legislative framework for mandatory disclosure on sale of commercial property is set out below. As the diversity of local legislation makes this framework the least desirable of the four options for implementing a mandatory disclosure scheme, a more detailed advice on the terms of relevant legislation is unwarranted until some firmer decisions on the threshold considerations have been made.

Australian Capital Territory
- No current legislative framework

New South Wales
- *Conveyancing Act 1919* (s52A)
- Conveyancing (Sale of Land) Regulations 2005 (Schedule 1)

Northern Territory
- *Law of Property Act* (s64(1))
- *Unit Titles Act* (ss26B, 26Q and 26ZI)

Queensland
- *Body Corporate and Community Management Act 1997* (ss206 and 213)

South Australia
- *Land and Business (Sale and Conveyancing) Act 1994* (s7)

Tasmania
- *Property Agent and Land Transactions Act 2005* (ss190 and 191)

Victoria
- *Sale of Land Act 1962* (s32)

Western Australia
- *Strata Titles Act 1985* (ss69, 69A and 69B)

6.3.2 MANDATORY DISCLOSURE ON LEASE

Each jurisdiction contains mandatory disclosure requirements for premises bearing some connection to the retail provision of goods or services, or located within a retail shopping centre. Furthermore, premises that could be considered to fall within the scope of 'retail' premises varies markedly in each State and Territory which makes a national comparison difficult.

Even where the mandatory regime applies to 'retail' premises, there are some substantial exemptions to the mandatory disclosure requirements which differ considerably in each State or Territory.

Outside the scope of 'retail' premises, there does not appear to be any mandatory disclosure regime in any State or Territory for the lease of commercial buildings comprising office accommodation.

The existing State and Territory legislative framework for mandatory disclosure on lease of commercial property is set out below. It was noted earlier in this Section that the diversity of local legislation makes this framework the least desirable of the four options for implementing a mandatory disclosure scheme. Therefore, while the relevant legislation is identified below a more detailed advice on the terms of this legislation does not appear warranted until some firmer decisions on the threshold considerations have been made.

Australian Capital Territory
- *Leases (Commercial and Retail) Act 2001* (ss30 and 31)

New South Wales
- *Retail Leases Act 1994* (s11 and Schedule 2)

Northern Territory
- *Business Tenancies (Fair Dealings) Act* (s19)

Queensland
- *Retail Shop Leases Act 1994* (s22)
- Retail Shop Leases Regulations 2006 (Part 2)

South Australia
- *Retail and Commercial Leases Act 1995* (s12)

Tasmania
- Fair Trading (Code of Practice for Retail Tenancies Regulations) 1998 (Schedule 1, clause 6)

Victoria
- *Retail Leases Act 2003* (s17)
- Retail Leases Regulations (Schedule 1)

Western Australia

- *Commercial Tenancy (Retail Shops) Agreements Act 1985* (s6)
- Commercial Tenancy (Retail Shops) Agreements Regulations1985 (reg 4 and Form 1)

6.3.3 POINT OF DISCLOSURE

The question arises as to whether the most effective and efficient point of disclosure is on sale or on lease.

Assuming that the aim is to optimise disclosure opportunities and create a more informed market, disclosure on lease is more likely to saturate the commercial office market as there are far more leases entered into on an annual basis than there are sales of commercial office buildings. Most commercial office buildings are multi tenanted and leases turnover on a more frequent basis. In addition, the demographic accessing the information is wider in the commercial leasing market. Purchasers of commercial office buildings are more likely to be drawn from a limited group of investors whereas tenants cover a very wide gamut.

The frequency of reporting will also impact upon this issue. Leases offer the opportunity for regular reporting (whether such reporting is done by annual renewal or extension, or at some other period). Disclosure on sale will only happen at less frequent periods as commercial freehold sale does not occur at the same pace.

However, the door need not be closed on having a complementary regime which requires disclosure on both sale and lease.

6.4 ENHANCED DUE DILIGENCE

Is it possible to mandate and/or enhance disclosure to potential lessees as part of the due diligence process in a lease transaction?

The due diligence process in a lease transaction is a commercial process and is usually driven by the potential tenant. The considerations which impact this process will depend largely on the time and resources available to the potential tenant, as well as the size, nature and location of the commercial premises. As this process is dependent upon the concerns of each individual tenant, a regulatory regime in this context could be viewed as unconventional and may not be an appropriate vehicle to introduce mandatory disclosure.

The response from the market to a regime of this nature is an important consideration at this point, especially in light of the nature of contract law and custom. Contract law is based upon the basic principle of parties engaging on a voluntary basis to enter into a contract on those terms and conditions that can be negotiated in each case. Often the negotiated terms and conditions of a contract relate to the provision of information by the landlord. While there is some legislation which addresses mandatory disclosure in respect of the ‘retail’ leasing, for the most part this legislation is based on consumer protection intended to protect those parties having the lesser bargaining power. It is considered that larger entities not usually subject to this type of consumer protection legislation may not be receptive to this type of change to contractual custom, particularly if those changes are accompanied by an enforcement regime.

Despite this, the current State and Territory mandatory disclosure regime for ‘retail’ premises could be enhanced independent of the tenant’s due diligence considerations. But this process will be difficult given the differences between the States and Territories retail leasing

legislation and the absence of a clear national framework of benchmarks to ensure the requirements for disclosure could be clearly stated.

Ultimately, unless a national mandatory disclosure scheme is adopted, mandating disclosure will be more difficult to drive disclosure through due diligence in a consistent manner. This does not rule out market forces and incentivisation as means of encouraging more extensive due diligence disclosure. This may be driven by the desire to achieve a better overall return, a larger potential tenant pool and improved reputation in the marketplace. This could further be enhanced if taxation opportunities were available which enhanced the attractiveness of improved disclosure through due diligence. Such options will require more intensive consideration and consultation including consultation with other Commonwealth portfolios and departments.

Any form of mandated due diligence pre supposes the establishment of suitable benchmarks and processes so that comparison of 'like with like' is feasible.

Regarding sales of the freehold interest in buildings, due diligence is undertaken by the vendor and purchaser in varying degrees as part of the sale process. Aside from the statutory disclosure requirements (which vary significantly across jurisdictions) the extent and type of due diligence is driven by commercial, operational and risk management objectives which can vary from building to building.

The discussion of the national legislative regime highlights the applicable legislation. If existing legislation is to be used it will be difficult to achieve a nationally consistent scheme given the divergence in local legislation (or lack of legislation).

6.5 GREEN LEASE SCHEDULE (GLS)

Is it possible to mandate the use of GLS elements in all commercial leasing transactions and how would this be achieved?

Mandating elements of the GLS through legislation is akin to establishing a mandated compliance scheme for the identified elements. For the purposes of this report, a reference to a mandated GLS compliance scheme is intended to refer to a scheme where only certain elements of the GLS are mandated by legislation.

In an abstract legal sense, it is open to governments to elect to mandate certain building energy requirements. Whether this happens through new legislation or existing legislation (locally or federally) similar issues are raised to those discussed in the disclosure options section above. However, having a tool for mandating compliance is not sufficient to support a decision to go down that path. The real issue is assessing and deciding whether that tool is the best one to achieve the objectives and, if so, how it should be used.

This, in turn, raises the following fundamental issues:

a) An assessment needs to be undertaken regarding which elements of the GLS are potentially suitable for mandating.

   The GLS and its concepts were developed in the context of traditional property and contract law concepts and, therefore, its processes and outcomes are tailored to those concepts and practices. It is fundamentally based on the freedom of parties to choose whether to enter into a particular lease transaction and to agree to the elements that

constitute the lease agreement. The acceptance level of the GLS continues to grow and the interest shown by non Commonwealth entities is largely driven by the market increasingly becoming attuned to the practical and commercial benefits that flow from it, as well as an increasing awareness of the environmental considerations in the commercial property market.

In contrast, a mandated GLS compliance scheme draws on a wider range of considerations and has different impacts on parties to lease matters. Therefore, just as the GLS suite itself was born out of a lengthy and detailed consideration of options, extensive stakeholder consultation, market input and risk assessment, so the development of any mandated GLS compliance scheme can only be achieved after further analysis and the determination of key threshold issues.

b) Technical assessment will be required to determine what is to be mandated. This is discussed below but ultimately the decision will need to be based on technical feasibility, ease of use and viability in the Australian property market.

c) Commercial and market considerations need to be assessed in detail. Any mandated GLS compliance scheme will need to be economically, environmentally and operationally viable.

d) The scope (including exclusions and exemptions) of a mandated GLS compliance scheme will need to be assessed. The parameters, in all likelihood, will need to be drawn differently to those in the Energy Efficiency in Government Operations Policy and the GLS. For example, there are likely to be differences in the area thresholds, which attract the particular obligations and the types of tenancies that fall within and outside the mandated GLS compliance scheme, may need to be different. Again, all this needs more detailed consideration and analysis.

e) A mandated GLS compliance scheme would also need to be assessed against other options (such as incentivisation) so that an informed decision on the best option can be made.

Market and economic considerations are discussed elsewhere in this report and they will also be key elements in the development and acceptance of a mandated GLS compliance scheme. In light of the above, it is apparent that there are a number of fundamental issues to be considered before any detailed assessment of legal feasibility and options can be undertaken.

6.5.1 ELEMENTS OF THE GLS CONSIDERED

The GLS has several core elements which will need to be considered which are:

a) The rating requirements.
b) Metering obligations.
c) Energy Management Plan.
d) Building Management Committee (BMC) (GLS A and B only).
e) Reporting.
f) Breach and remedial action provisions.
g) Dispute resolution.

The above are, in turn, supported by a range of supporting requirements, processes and tools.

All the above present challenges to a mandated GLS compliance regime. There are elements in the above which do not make them immediately suitable for such a regime until further analysis and risk assessment is undertaken. Once the workable elements are identified and settled they will need to refined and tailored for a statutory regime.

RATING SCHEME

The GLS uses the ABGR Scheme as the rating tool and key performance metric. There are also policy considerations behind the Australian Government endorsement of the ABGR Scheme over other schemes. However, other schemes would also need to be considered and assessed.

A further consideration is whether the statutory scheme could be self contained where its own performance outcomes and measures exist independently to other schemes.

The performance outcomes and measures selected ultimately need to be simple and easy to measure and achieve.

An underpinning consideration is how and by whom performance is to be measured. Options include self regulation and flexibility as to choice of assessor, constraining who can undertake assessment for the purposes of the scheme and setting up more regulated processes for authorised assessors. There may be a range of other alternatives.

The cost of the scheme will also be a factor including where the up front cost will be incurred and what flow through there may be of those costs. For example, if building owners incur certain compliance costs, should there be limitations on their ability to pass those costs onto tenants (as in the GLS) or will market practices and forces be allowed to prevail and determine what can be passed on.

METERING

The requirement for individual digital metering for leased premises is probably the component of the GLS which can most easily be regulated through legislation. The extent of the requirement for separate meters and the nature of meters would need to be settled and governments have a range of options as to which legislation is used to entrench the requirement. Planning and building legislation and codes can be used, as well as some of the legislation discussed in the disclosure options above.

A cost/benefit analysis could be used to support the metering requirement and consideration will be required to ascertain if legislation will regulate this requirement and which party will bear the initial cost.

ENERGY MANAGEMENT PLAN

A mandated GLS compliance scheme could require that an Energy Management Plan is to apply to the lease transaction. However, given the wide range of tenancies, the most feasible way of achieving this is to identify what an Energy Management Plan must contain as a minimum. Consideration will be needed regarding whether a standard prescribed form is to be used or whether it is more feasible to allow some latitude. The input of assessors would be useful to ensure that all relevant information is captured and delivered in readily usable form.

BMC

The BMC processes in the GLS would not be suitable for a mandated GLS compliance scheme.

These provisions reflect a contractual agreement regarding function, scope of authority, processes and protocols. Legislation is not the ideal vehicle for implementing such detailed arrangements and in non government transactions there are elements of the BMC processes which the market could alter without attacking the integrity of the clauses (such as the delegation and limitation of authority issues). This also demonstrates the converse situation, namely, that any legislation would need to be couched so that it does not unduly fetter governments in the performance of their functions nor attract undesirable risk or potential breach of other government requirements. The limitation of the powers of the BMC is an example. Two non government parties could potentially live comfortably with a scheme where the BMC representatives have decision making powers but this could have serious consequences for governments and other organisations where the decision making power may rest with a delegate who may not be part of the BMC.

REPORTING

The extent and nature of reporting would need to be determined by the scope of the mandated GLS compliance scheme. Such a scheme would draw on different requirements to the GLS and, therefore, the reporting obligations and tools will also need to reflect those requirements and be easy to use and cost effective.

BREACH AND REMEDIAL PROVISIONS

The breach and remedial provisions in the GLS reflect the specific policy initiative and the risk assessment underpinning the GLS. A mandated GLS compliance regime would be different in scope and form, and a risk assessment for that scheme would be needed to identify the most workable and effective options for non compliance and remediation. What works in a lease transaction (which is by nature voluntary and leaves room for the parties to fine tune provisions to ensure compatibility between the GLS and the base lease) will not necessarily work in a statutory scheme. Legislation is a different vehicle and different considerations apply.

DISPUTE RESOLUTION

The GLS dispute resolution provisions reflect a commercially viable approach for determination by an expert and the intent has been to remove the risk of legal action through the courts or arbitration. This approach was underpinned by the risk analysis of the GLS. The considerations for legislation are different, and while alternative dispute resolution may be appealing (at least as the first point in resolving a dispute), the considerations for a far reaching mandated disclosure scheme are different. Hence, a focussed risk analysis would be needed once the threshold issues were resolved.

6.6 OTHER CONSIDERATIONS

6.6.1 NATURE OF LEASES

The nature of energy performance and management in buildings is not a straightforward issue. Any mandated GLS compliance scheme will still sit alongside arrangements governed by lease provisions which vary widely on a case by case basis. The Australian property market is used to considerable freedom in the negotiation of lease terms (apart from areas such as retail and residential leasing where consumer protection laws have greater impact).

This means that the parties will still be apportioning risk and liability under the terms of the lease. This may be in a general sense (such as general compliance with laws provisions) or more specifically (such as in the maintenance and repair obligations).

The very nature of leasing also means that there may be many situations where one party may be 'technically' non compliant, however, the other party may have contributed to or caused that non compliance. Energy efficiency is dependent on many underpinning requirements and contractual arrangements. Not only are there issues of what the landlord and tenant are responsible for and how they have contributed to a situation, but there are also considerations about third party impacts (for example the landlord's contractors caused the landlord to fail to meet its obligations) or 'Acts of God'.

6.6.2 MARKET RECEPTIVENESS

While supporting particular energy related objectives, the GLS is essentially a contractual arrangement between the parties to a lease. While legislation is used to mandate certain concepts and requirements in legal documents (e.g. retail leases legislation may prohibit certain types of provisions and sale of land legislation may require certain information or terms to appear in the sale documentation) to actually require elements of the GLS to be mandated may encounter some resistance from the market. The extent of resistance would need to be assessed through focussed market analysis.

The response from the market to the mandated use of GLS elements in all commercial leasing transactions is an important consideration given the nature of contract law and custom. Contract law is premised upon the basic principle of parties being free to enter into an agreement on those terms and conditions that are negotiated in each individual case. A mandated GLS compliance scheme could be viewed by the market as contrary to this basic principle of contract law, by imposing mandatory terms in commercial leases and dictating how those lease terms must be drafted.

As discussed above, while some legislation addresses the use of certain documentation in retail leasing (e.g. the provision by the landlord of disclosure statements regarding aspects of the building or premises) and conveyancing (e.g. vendor's disclosure statements), for the most part, this legislation is based on consumer protection intended to protect parties who have the lesser bargaining power. Larger entities not usually subject to this type of regulation may not be receptive to this change in contractual custom, particularly if those changes are accompanied by an enforcement regime.

6.6.3 SUMMARY ON MANDATING ELEMENTS OF THE GLS VIA A MANDATED COMPLIANCE SCHEME.

While legislation is available as a tool for delivering a mandated GLS compliance scheme, a range of very fundamental issues need to be investigated further before additional legal advice can be provided. There are many practical, technical, commercial and management issues which first need identification, analysis, consultation, consideration and refinement before the development of an effective legal framework.

7 PRELIMINARY ECONOMIC ANALYSIS (ACCESS ECONOMICS)

7.1 BACKGROUND ON BROAD-BASED EMISSIONS TRADING SCHEMES

This report has been motivated by the decision to implement a disclosure regime for commercial buildings as part of Stage One of the National Framework for Energy Efficiency (NFEE 2007). This report discusses and analyses the need for such a policy in light of potential market failures present in the sector, then considers a disclosure regime as one of several policies which could potentially address these barriers. Before discussing these aspects, however, the report discusses broad based current climate change policies and the impact of the commercial building sector on national emissions, which form a backdrop to the policy debate.

Any disclosure regime for commercial buildings needs to be assessed in the context of the policy issues under consideration. In the case of commercial buildings, the disclosure regime needs to be considered in the context of the overall desire to both enhance energy efficiency and reduce greenhouse gas emissions. A key mechanism to reduce Australia's emissions is the establishment of an emissions trading scheme (ETS). This was foreshadowed in the recently released report by the Prime Minister's Task Group. In that report, complementary policies to address energy efficiency, particularly in the building sector, were mentioned.

Australia's current policy objective is to meet its Kyoto Protocol target of restraining emissions for the period 2008-2012 to 108% of 1990 levels (i.e. around 600 Mt per annum, compared with BAU emissions of around 650Mt in 2007 and just below 700Mt in 2010).[3] Figure 7.1 below shows that under the 'with measures' forecast, Australia is on track to meet that target – or at most, miss it by a small amount – in large part because of moves to address land clearing.

[3] The report was written before the Kyoto Protocol came into force. However, the ratification is unlikely to change any results from this report. The introduction of an emissions trading scheme was assumed as likely anyhow, while the carbon price discussed in 7.2.3 is not known and is a best estimate in either case.

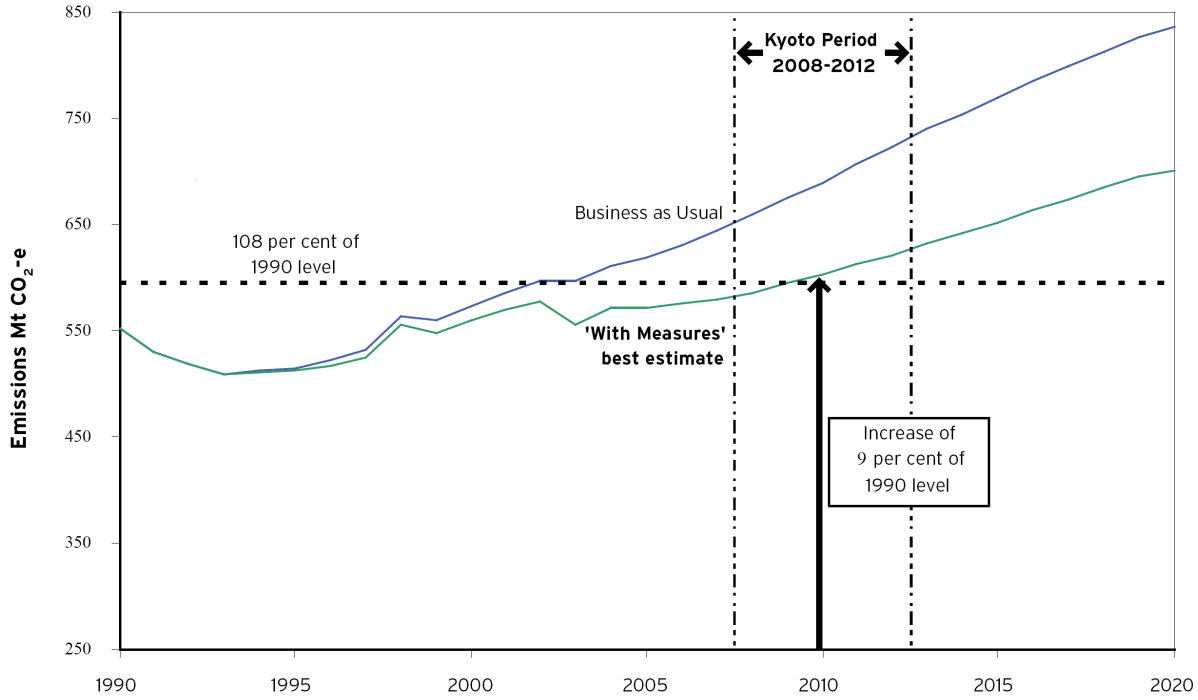


Figure 7.1 Australia's Projected Greenhouse Gas Emissions

The Prime Minister's Task Group on Emissions Trading presented its report on 1 June 2007. The Task Group recommends a market-based approach to emissions reduction with emissions trading preferable to a carbon tax. However, actual emissions targets are yet to be determined.

The Task Group has not recommended exact targets on post-2012 emissions. What it does argue for is the need to establish a solid framework for an ETS and to commit to this as soon as practicable in order to reduce uncertainty for business investment. The scheme will aim to cover 70-75% of total emissions or almost 100% of industrial, energy and mining emissions. Including large emitters alone, the scheme would cover 55% of total emissions.

A flexible 'cap and trade' model is the most common type of an emissions trading system and is seen as a suitable option for Australia. According to the Task Group, such a model should have the following features:

- A long-term aspirational emissions abatement goal and associated pathways.
- An overall emissions reduction trajectory that commences moderately, progressively stabilises and results in deeper emissions reductions over time.
- Maximum practical coverage of all sources and sinks, and greenhouse gases.
- Initial exclusion of agriculture and land use.
- A mixture of free allocation and auctioning of yearly emissions permits.
- A 'safety valve' emissions fee.
- Recognition of a wide range of credible carbon offset regimes.
- Capacity, over time, to link with other comparable national and regional schemes.
- Incentives for firms to undertake abatement in the lead-up to the commencement of the scheme.
- Revenue from permits and fees to be used to support emergence of low-emissions technologies and energy efficiency initiatives.
- Flexibility to allow calibration of the short-term emission caps sequence.

At this conceptual level, it appears to be quite similar to the trading scheme already operating in the EU. Specifics about the allocation and trade of permits are yet to be established. However, once allocated, permits with varying dates can be traded with the price determined by the supply and demand for permits, thereby allowing market forces to find least-cost ways of reducing emissions. It is further expected that related products such as warrants, futures and options will emerge and form the basis of the derivative markets that will support the ETS.

Overall, a cautious approach is recommended, as the reduction of emissions should be achieved with minimum cost of abatement and any premature introduction of an Australian ETS could undermine the stability of the scheme. The scheme would take a minimum of four years to establish with the following mile stones (based on work commencing in 2007):

- 2008 - Announcement of a long-term aspirational emissions abatement goal and establishment of an emissions reporting and verification system.
- 2009 - Establishment of a legislative basis of the scheme.
- 2010 - Establishment of the first set of short-term caps and allocation of permits.
- 2011 or 2012 - Commencement of trading.

Since no emission target (or cap) has been set,[4] it is currently unclear what the future carbon price will be. This will depend on the level of abatement targeted, the timeline of the target and several other market dependent factors. Preliminary modelling is available from several sources and indicates that this price will be somewhere in the range of $20-$50 per tonne of carbon dioxide equivalent. In Europe, for instance, permits for the emission of one tonne of CO_2 are priced at just over EUR20 (A$32) for delivery in 2008 (Point Carbon 2007).

Whatever form the emissions trading scheme takes it is likely to be aided by specific sector-based policies, if not permanently, at least during a transition period. Various distortions in the economy ('market failures') may mean that the price signals of a trading scheme do not lead the market participants to respond in an efficient way and intervention to remove these market failures may be desirable. Page 12 of the Task Group's report states:

> *'Emissions trading is not a panacea. A comprehensive response will involve complementary measures that address market failures not corrected by the emissions trading scheme.'*

The Task Group report specifically identifies the building sector as one area where market failures may impede the effective workings of an emissions trading scheme by stating that:

> *'[T]here is some evidence that households and firms do not always take up opportunities for seemingly cost-effective improvements in energy efficiency'* (National Emissions Trading Taskforce 2006).

Upfront costs have been raised as a possible barrier to the take up of cost-effective improvements (CIE 2007). In the case of residential buildings, liquidity constraints, access to finance and mortgage stress may be an issue for homeowners. However, the commercial building sector is dominated by large sophisticated investors with ready access to financial

[4] The ratification of the Kyoto Protocol has only recently been decided upon and no details in regards to a future ETS have been established yet.

markets, so the issue of upfront costs is not a plausible source of market failure in the case of commercial buildings, though this may remain relevant for residential buildings.

A general lack of access to information ('information asymmetries'), the cost of obtaining information on efficiency ('search costs') and the split incentives between landlords and tenants (the 'principal/agent problem') are possible sources of market failure. These and other market failures are considered in detail in 7.3.

7.2 ENERGY USE IN COMMERCIAL BUILDINGS

7.2.1 CURRENT ENERGY USE

Currently, around 300 petajoules of energy are consumed annually in the commercial building sector. This equates to around 60 Mt of CO_2 emissions in 2007 or almost 10% of the total emissions in the Australian economy, of 650 Mt (AGO 1999b). Without any intervention, emissions from the commercial building sector are projected to increase by almost 2 Mt per annum, reaching 100 Mt by 2030 and 140 Mt by 2050 (refer to figure 7.2).

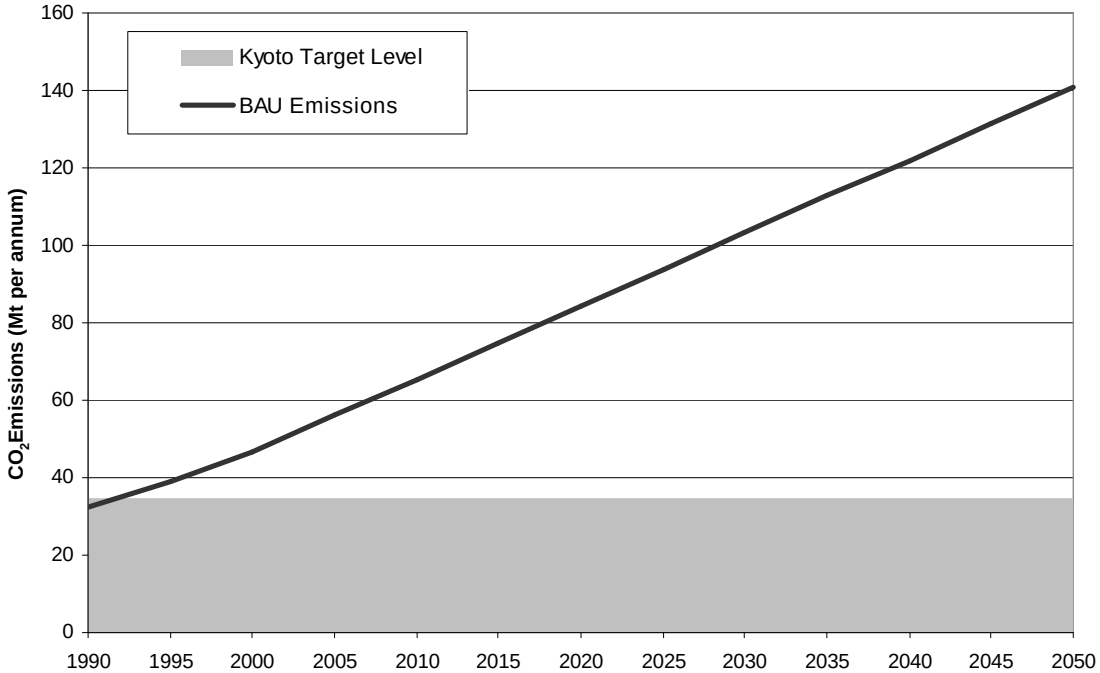


Figure 7.2 Forecast Commercial Building Greenhouse Gas Emission Levels [AGO (1999) for the period to 2010, CIE (2007) for the period to 2050]

Figure 7.3 shows the proportions of energy use and greenhouse gas emissions caused by energy applications within the commercial building sector in 1990. Cooling, heating, ventilation and lighting account for around 85% of energy and greenhouse gas emissions in the commercial building sector.

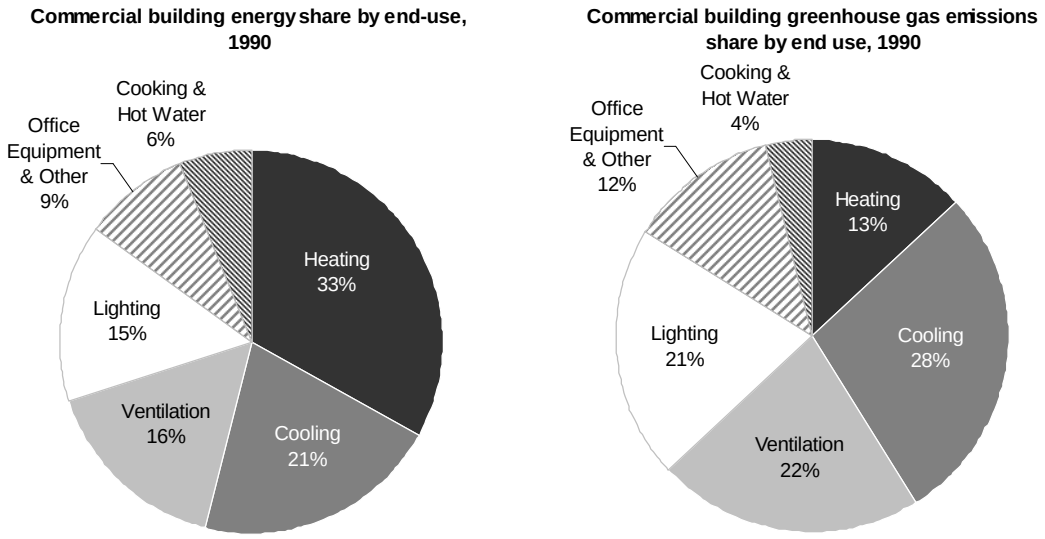


Figure 7.3 Commercial building energy share and greenhouse gas emissions share by end use (AGO 1999b)

Offices were responsible for an estimated 27% of commercial building sector emissions in 1990. Hospitals (13%), public administration and community services (10%) and food stores (6%) are other major contributors (refer to figure 7.4). While office buildings alone contributed 8.5 Mt in emissions in 1990 to the commercial buildings total, this figure is expected to almost double to 16.5 Mt in 2010.

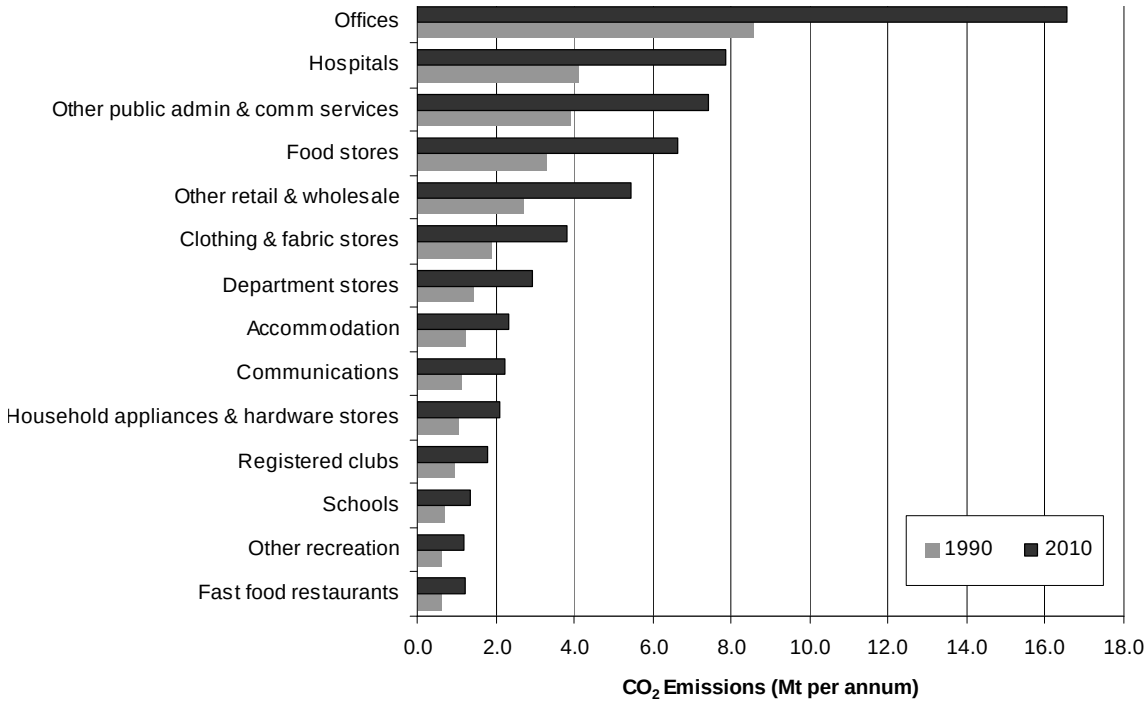


Figure 7.4 Commercial building greenhouse gas emissions by key building type, 1990 and 2010 (AGO 1999a)

7.2.2 OPTIMAL ENERGY USE

The average commercial office building has an ABGR energy rating of around 1.5 to 2 stars ('poor' to 'good'). On a scale of up to five stars ('exceptional'), there is room for improvement. However, while there is scope for improvement, it is difficult to say what is

the optimal level of efficiency for existing buildings. Consultation with an ABGR assessor revealed that increasing the energy efficiency of a four star building to be commensurate with a five star may be prohibitively costly. If the cost of doing so is greater than the cost of reducing the same level of emissions elsewhere in the economy, then it will not be optimal. Importantly, the cost of reaching a given level of energy efficiency will differ between buildings as will the optimal level of energy efficiency.

While new technologies always take time to be adopted (refer to figure 7.5 which illustrates how quickly new technology spreads), the notion is that adoption of energy efficiency measures happens below its optimal rate. Optimal diffusion of those measures fails to occur due to market failures or other market barriers and impediments discussed in the following sections.

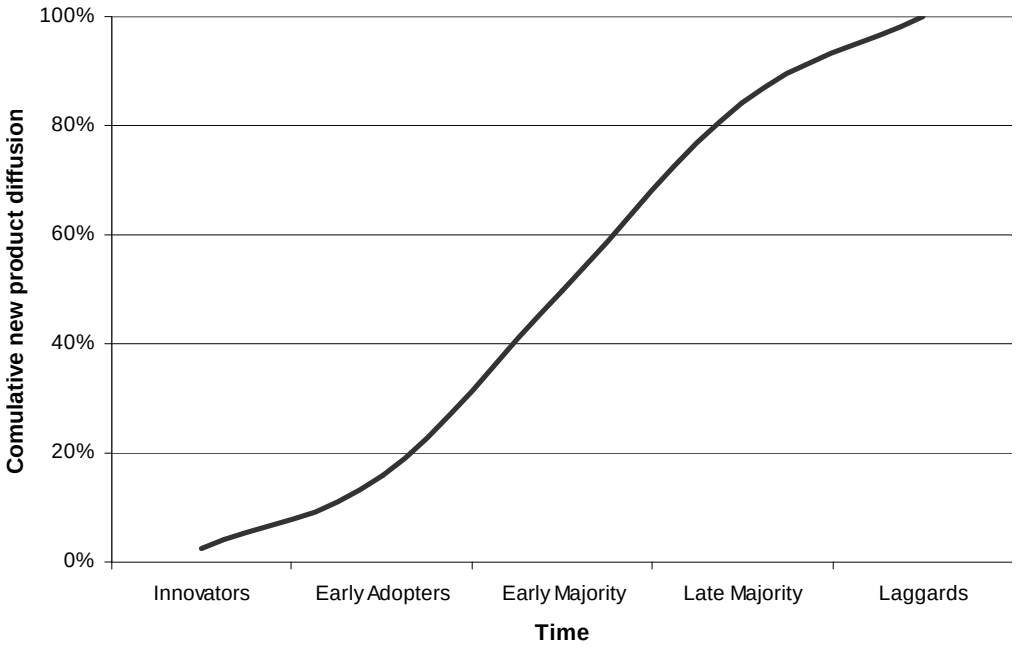


Figure 7.5: New Product Diffusion Curve

According to estimates by Vattenfall (cited in CIE 2007), the abatement potential in the case of air conditioning is 37% of business-as-usual (BAU) energy consumption, 38% for appliances, 59% for heating and ventilation, 12% for lighting and 28% for water heating. However, not all options are similarly cost effective: savings from lighting and air conditioning, for instance, are easier to achieve (more cost effective) than savings from water heating or space heating. Overall, emissions from the commercial building sector could be reduced by around 30% to 40% compared with the BAU case.[5] Refer to Figure 7.6, which illustrates the impact that these energy efficiency measures could have on carbon dioxide emissions over time: instead of increasing to 140 Mt in 2050, emissions could be at a lower 80 Mt to 90 Mt in 2050 (up from the current emissions level of around 60 Mt).

Vattenfall estimates that 30% of the potential abatement can be achieved by 'no regrets' opportunities (i.e. 30% of 30% to 40% or a potential abatement of around 10% when compared with the BAU scenario). Further energy savings could be achieved by 'no regrets' options with a broad-based ETS in place, as a higher energy price makes some energy-saving options cost effective that were not initially cost effective. Two key issues in this context are

[5] The CIE (2007) adjusted the Vattenfall study to the Australian context and estimated that emissions from the commercial building sector in 2050 could be reduced from 141 Mt to 95 Mt (i.e. by 33%).

the price of carbon determined in an ETS and the pass through of carbon prices to electricity which is the main energy source of buildings.

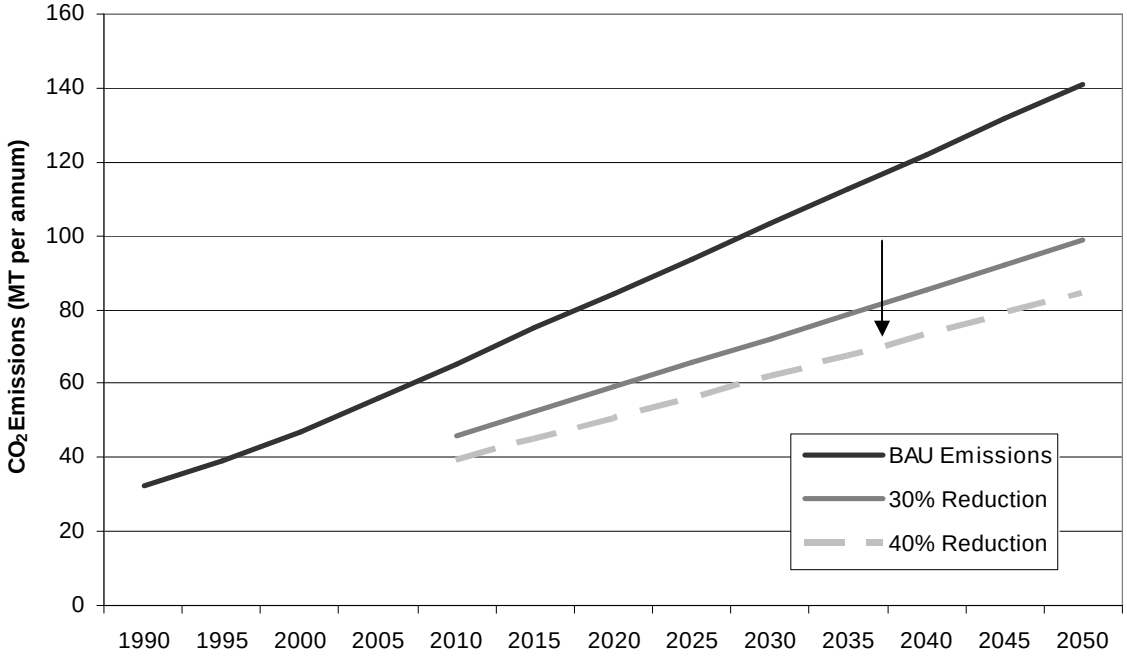


Figure 7.6: Forecast Commercial Building Greenhouse Gas Emission Levels with Reductions (Access Economics, applying reduction scenarios to Figure 7.2)

The Sustainable Energy Authority of Victoria (SEAV) also conducted a study into the potential for no regrets investments in energy efficiency. It compared forecasts of BAU energy use against energy use under the adoption of several cost effective improvements for both new and existing commercial buildings under a range of assumptions. It concluded that by 2010 commercial building emissions could be 10.4% lower than the BAU projection if the improvements were made (Productivity Commission 2005).

The Clean Energy Future Group (CEFG) carried out a similar investigation with different assumptions. Specifically, it allowed for a longer timeframe over which improvements to buildings could be made and included a carbon pricing scheme, with energy costs rising between 25-50% over the specified timeframe. Under these more optimistic assumptions it concluded that 39% reductions could be made over the BAU scenario (Productivity Commission 2005).

The Productivity Commission (2005) has taken a more sobering view of the potential for no regrets improvements. In its review of cost effective energy efficiency it states that:

> *'More recent economic modelling undertaken for the NFEE suggests that the economic and environmental potential of closing these gaps might be considerably less than was first thought. Using a bottoms-up approach, the modelling has estimated that energy efficiency gains of between 5 and 14 per cent of current energy usage could be achieved, depending on the industry sector'.*

It also states that, '*there is such uncertainty about the size of the gains to be made (with so many unknowns), that it is impossible to say just how big they are'*. The Productivity commission report also argues the need to include the totality of costs in considering the

implementation of energy efficiency devices such as managerial time involved and the tendency for profit satisfying when energy costs are only a low proportion of total costs.

7.2.3 CARBON PRICES AND COMMERCIAL BUILDING ENERGY COSTS

This section presents some figures on the energy usage of commercial buildings and the possible effect of an emissions trading scheme on energy costs. Because of higher energy prices, people and firms may be more inclined to adopt energy efficiency measures, reducing excess usage of energy by commercial buildings. The higher the price of energy, the more options become cost effective.

These numbers should be viewed as indicative because the extent to which electricity prices rise depends upon the carbon price and on the degree to which this price is passed onto consumers. In practice, it is likely that the input mix of electricity generation would change over time (i.e. less coal, more gas and renewables), electricity producers would absorb some of the costs and only the balance would be passed onto consumers. This arises as the carbon-intensity of the marginal electricity generator (which, in turn, determines the price at which the electricity market clears) may differ from the average carbon-intensity of all electricity generators. Hence, only a proportion of the increased costs of production are passed onto wholesalers. These wholesalers act as middlemen between the creators and end users of electricity and, in turn, absorb some of the increases in electricity prices. Finally, the degree of pass through is also affected by the complicated nature in which electricity prices are regulated.

The energy costs per square meter will also differ between locations. The value used below, $17 per square metre, is at the lower end of the scale. The climate will affect how much energy is used, while the energy price will depend upon the mix of generators supplying the grid and the fuel source used to generate the electricity. A higher cost per square metre will result in a lower effect of a carbon trading scheme in percentage terms.

Preliminary modelling of the carbon price needed to achieve abatement in the range usually considered puts this number at around $40 per tonne of carbon dioxide equivalent emissions. This varies with the assumptions used, such as the timeline of the trading scheme, the degree of technological advance and the target level of abatement. However, it is a useful starting point for a quantitative analysis. A carbon dioxide price in the order of $40 would increase the price of energy per square metre per annum by around $2. This is based on the following assumptions:

- The price per tonne of CO_{2e} is $40.
- A 25% pass through of this to end consumers. This is based on the assumption that 50% of the costs are passed onto the wholesale market by producers[6], while 50% of this amount is passed onto consumers.[7]
- One tonne of CO2e emissions equates to around 5,000 Megajoules (MJ) of energy consumption (or 1,400 kilowatt-hours).[8]

[6] Rule of thumb estimates derived from economic modelling work undertaken by several modelling groups in Australia vary in a wide range of $0.25-0.55 /MWh per $/t CO_2e carbon price reflecting different modelling assumptions.

[7] This reflects the additional costs associated with transmission, distribution and the like.

[8] Based on the AGO (1999b) estimate of 300 petajoules of energy consumption and 60Mt of CO_2 emissions in the Australian commercial building sector in 2007, as discussed in 7.2.1. While some buildings may derive a larger share of their energy from gas, which is less emission intensive, the numbers used in this report are based

- An average office building uses around 970 MJ (or around 270 kWh) per square metre per year (AGO 2002 Figure 1) which equates to around 0.2 tonnes CO_2/m2 per annum.

If the average office building has an ABGR star rating of 1.5 to 2 stars [9], the energy bill per square metre would increase from around $17 (Investa 2006 p. 17) to $19[10] per annum (i.e. a 12% price increase). For a 10,000 m^2 office building that means the energy consumption would increase from $170,000 to up to $190,000 per annum (i.e. an increase of up to $20,000).

However, with current office occupancy costs ranging from $325 to $780 per square metre for the major Australian cities (DTZ Research 2007), energy costs account for only 2% to 5% of total occupancy costs. With the introduction of a broad-based ETS (and a carbon dioxide price of $40), energy costs would increase by around 0.5% to 1% to a share of occupancy costs of around 2.5% to 6% which is still small relative to total occupancy costs. That is:

- Energy costs account for only a small proportion of total building costs.
- Placing a price on carbon will only result in a small increase in this proportion.

Given this, it has been argued that the small proportion of costs attributable to energy use has meant building owners and users do not consider ways of improving energy efficiency in any real detail. Even if demand for tenancies was reasonably elastic to occupancy costs, the small proportion of energy costs within total occupancy costs means that demand for tenancies is undoubtedly very inelastic to energy prices.

Several studies show that there is in fact substantial scope for cost effective investment in energy efficiency which is not realised. For example, the IPCC states that '*by 2030, about 30% of the projected GHG emissions in the building sector can be avoided with net economic benefit*' (IPCC 2007 p. 13). Hence, while there is little incentive for individuals in this investment, in aggregate the potential abatement opportunities from the commercial building sector may be large.

While a broad-based ETS increases the number of cost effective energy efficiency measures and potential for reductions in greenhouse gas emissions (with the extent depending on the carbon price), on its own it may not address the problem that some businesses do not introduce these measures despite their cost effectiveness, an issue that will be discussed in more detail later. Hence, there may be a role for the government to play in reducing emissions which do not appear to be sensitive to energy prices, particularly at relatively low carbon prices.

7.3 POTENTIAL MARKET FAILURES

As discussed above, the scope for cost effective efficiency improvements may mean that an 'energy-efficiency gap'[11] exists between actual and optimal energy use in the commercial building sector.

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on average values for the commercial building sector. One kilowatt-hour equals 3.6 Megajoules (see www.unitconversion.org).

[9] Based on discussion with PC Thomas from Team Catalyst.

[10] That is, of the $40 cost increase per tonne of CO_{2e} emitted, $10 per tonne is passed onto consumers, who emit 0.2 tonnes, costing them $2.

[11] A term used by Jaffe and Stavins (1994).

If barriers or distortions exist that prevent the free workings of a market, the optimal level of a given activity may not take place—in this case, cost-effective investments to improve the energy efficiency of commercial buildings. This situation is referred to as a 'market failure' and the existence of a market failure may provide a justification for government intervention—provided the intervention provides more abatement benefits than it costs to administer.

Such market failures may be caused by a variety of factors and which may result in the suboptimal take up of cost-effective investments to improve energy efficiency in the commercial building sector. These are particularly pertinent given current concern over the level of greenhouse gas emissions in the economy and the large proportion of end electricity use coming from the commercial building sector.

Essentially, there are two major types of market failures: those related to the externality of climate change and those related to the lack of awareness of 'no regrets' options. Contributing to these are other market failures such as information asymmetries, search costs, principal agent problems and free rider problems. Finally, there are a number of market barriers and impediments including cost barriers, conservatism, risk and uncertainty, inertia, habit, fixed term leases and lack of concern, as well as the rebound effect which may contribute to energy consumption above its optimal level. However, these do not qualify as market failures as they may hinder, but do not stop, the market from functioning efficiently—or in other words, the market will eventually get to an optimal point but it may take a few years to get there (particularly if many tenants have leases that don't expire for several years). While there are costs of delays, these barriers are typically of less concern compared with market failures that prevent the market ever getting to an optimal point.

Of course, virtually every market in the economy has some imperfections, so the mere existence of a few wrinkles in the functioning of a market is insufficient to justify government intervention. The imperfection needs to be significant, and able to be influenced positively by intervention, while avoiding unintended consequences or high compliance costs.

7.3.1 LACK OF AWARENESS OF 'NO REGRETS' OPTIONS

Even in the absence of a climate change policy such as an emissions trading scheme, there are substantial opportunities for cost effective energy saving improvements. Such schemes exist when the present value of the energy savings in dollar terms outweigh the costs of installing the energy saving devices. A lack of information about the potential for savings has meant that they have gone unexploited by building owners. The ABCB Regulation Impact Statement states on page 53 that:

> *'[T]he generality of owners and tenants are unaware of energy efficiency issues, particularly tenants. There was general agreement that there is no significant price premium for energy efficient buildings. However, the situation may improve if and when more systematic disclosure is required and awareness is improved.'* (ABCB 2006b)

These 'no regrets' energy saving opportunities are shown diagrammatically in Figure 7.7. The vertical axis measures the cost of emissions abatement while the horizontal axis gives the amount of abatement. The marginal cost of abatement curve shows the incremental cost of reducing emissions by an extra tonne of carbon dioxide equivalent emissions. An abatement target shown as point A in the diagram would involve some expenditure on energy savings with a positive net cost, however, abatement can initially be achieved through undertaking

energy saving schemes with negative net costs (i.e. net benefits to the building owner on narrow financial grounds) in present value terms. These are shown as the level of abatement available up to the point B. Hence, this level of abatement can be achieved with positive economic benefits even before the wider benefits to society from the reduced emissions are considered.

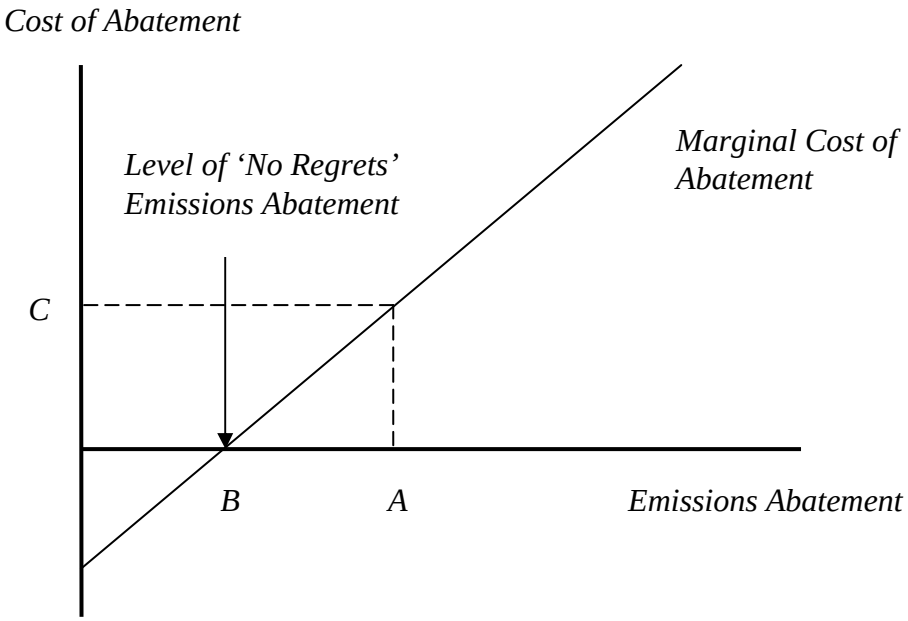

Figure 7.7 'No regrets' and target levels of abatement

Studies reveal that these 'no regrets' opportunities may in fact be large and apply broadly across the commercial buildings sector. Simple steps can be taken, such as refitting existing lighting, or ensuring electrical equipment is switched off after hours, where the electricity savings will outweigh the costs of these changes in the majority of buildings. In fact, the ABCB Regulation Impact Statement reports benefit to cost ratios for the improvements considered in that report of between 3.2 (Canberra) to 10.8 (Darwin) for office buildings in Australian major cities.

Consultation with energy rating consultants, Team Catalyst, revealed a similar story. It was revealed in the majority of cases that upgrading an existing building from two to three stars (using the ABGR rating system) would cost around $61 per square metre which could be achieved mainly through improving lighting. The GLS published by the AGO (see 7.4.1 below) reports that the annual energy bill savings of moving from a two to three star rating are around $3 per square metre. While this may not seem appealing, when the equipment or plant is due to be replaced in any case, substantial gains may be made through replacement with energy efficient devices. This is discussed in more detail in 7.5.

An obstacle to achieving these 'no regrets' energy investments is the ability, or lack thereof, for the costs of the improvements to be passed onto those who receive the benefits. This occurs when the party making the investment is not the same as the party who pays the energy bill. Even if a building owner is aware of cost effective improvements, they have no incentive to invest in them if they can't extract the extra benefits from the tenant in terms of higher rents. This problem is likely to be mitigated to a large extent if the general awareness of 'no

regrets' opportunities is raised and if they are embraced by a larger group of building owners which, in turn, brings energy efficiency more into the pricing decision.

Of crucial, importance in determining the optimal policy to target emissions abatement in the commercial building sector is knowledge of the shape of the marginal cost of abatement curve. It shows how costly it is to achieve a target level of abatement, or alternatively, how much abatement can be achieved for a given cost. This curve has been drawn above as linear for convenience, however, in reality it is likely to be non-linear and contain jumps at points where significant or expensive action is needed to further increase energy efficiency. If costs increase steeply at some point then abatement beyond that point may be sub-optimal with the costs outweighing the benefits.

This point will be addressed in more detail later in this report, however, it is sufficient to note that evidence suggests that the marginal cost of abatement curve is generally smooth and upward sloping. Discussions with Team Catalyst revealed that substantial reductions in energy use can be achieved through relatively cheap action such as improving lighting or switching off appliances after hours. Further abatement may require changes to heating and air conditioning (which are generally more expensive), with improvement beyond four stars requiring a more substantial action such as the replacement of windows and major structural changes. In dollar terms, it was estimated that the cost of increasing a rating from two to three stars is around $61 while increasing from three to four stars is around $111. Similarly, the ABCB RIS referred to modelling which concluded that *'the relationships between energy savings and costs can be taken as relatively smooth'* and identified that there are upward jumps at the points where double glazing of windows and increased insulation is required.

7.3.2 THE EXTERNALITY OF CARBON EMISSIONS

The second main market failure is the externality associated with carbon emissions into the atmosphere. Indeed, this is the impetus behind the climate change debate. Building owners pay for the electricity they use but not for the additional cost that the creation of the electricity places on global society as a whole. Hence, while the last section discussed energy saving expenditure which is privately profitable, there may also be substantial opportunities for expenditure on energy efficiency which is socially (but not privately) profitable and should, therefore, be encouraged through government intervention.

This intervention may take a variety of forms, however, given that business has no incentive to implement them without intervention, it will typically be more direct and heavy-handed compared to the policies merely aimed at encouraging the uptake of the 'no regrets' options. Figure 7.7 above indicates that the government can limit emissions either by targeting policies at the level of electricity used directly or by providing price-based incentives for reducing electricity consumption.

The latter of the two policy types may be implemented through such means as taxes on energy use or subsidising expenditure on energy saving actions. Perhaps the most obvious example of these is an economy wide carbon price based on tradeable emission permits. Other examples are incentives such as accelerated depreciation or subsidies on specific appliances.

Policies may also be chosen that target the desired level of abatement directly. An example would be a policy which mandates that all buildings must have a specified ABGR star rating by a certain year.

When the marginal cost of abatement is known with certainty, the choice of which policy type, price or quantity controls is essentially arbitrary as, for any given abatement cost, the level of abatement chosen will be known. However, when the abatement cost schedule is unknown (a more realistic scenario) the policy chosen will have to consider what shape it could take. This is explained in Figure 7.8.

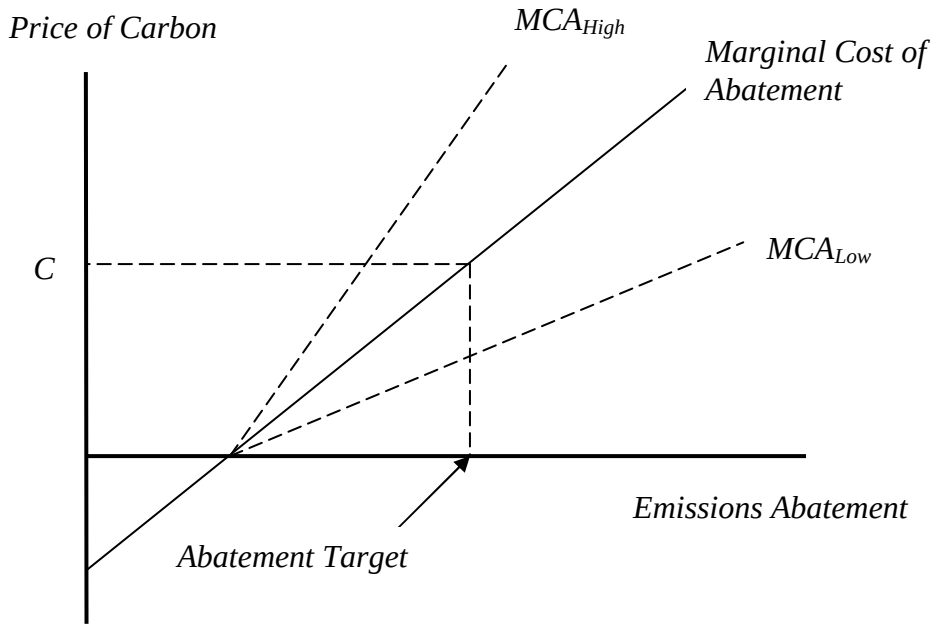

Figure 7.8 Uncertainty of the Marginal Cost of Abatement schedule

Suppose the expected marginal cost of abatement is the given by the thick line marked as shown. To reach the target abatement level, a marginal cost of abatement of *C* would be expected and a tax on carbon (or a subsidy on abatement of equal amount) could be used to reach this target. However, if the cost of abatement is unknown, the effect on costs or abatement levels is less certain. Suppose that the marginal cost of abatement schedules are known to be in the range of MCA_{High} to MCA_{Low}. If the same abatement target shown above is mandated through policy (e.g. by mandating that all buildings must have a four and a half star ABGR rating within three years), then this may result in a marginal abatement cost either much higher or lower than *C*. Indeed, the costs of achieving this level of abatement may be prohibitively high for some businesses and, so, they may exit the industry. On the other hand, a tax, while limiting the exposure of businesses to high costs of abatement, may result in an uncertain level of abatement which could either be substantially higher or lower than the optimal amount.

As is often the case with heavy-handed regulations such as these, the regulator is unlikely to have the precise detail and data (and perfect foresight) required to accurately predict the shape of the future abatement curve which could lead to unworkable regulations. 'Regulatory error' is a well-documented situation that arises when the regulator has less-than-perfect information on costs structures and, as a result, sets regulations at an incorrect level.

7.3.3 INFORMATION ASYMMETRIES

In addition to a lack of awareness and the externality of carbon emissions, other potential market failures exist that are secondary issues. While they may be of some concern, they appear to be limited in their ability to explain the current excess energy consumption and lack

of cost-effective investment in energy efficiency throughout the commercial building sector. The first of those issues relates to information asymmetries.

Markets tend to function more efficiently when buyers and sellers are both well informed about the quality of the goods or services being sold. However, for commercial tenancies, accurate information about the energy quality of a tenancy may be unobtainable. Asymmetric information exists if one party to a transaction has more or better information than the other party about the quality of the good being sold.

In the case of commercial buildings, it may be difficult for the buyer or future tenant to determine how a unit or whole building is energy efficient. By contrast, the seller or owner of the property would likely have a good idea of the building's energy efficiency (including the heat loads of the other tenancies in the building). This asymmetric information may cause significant problems with the efficient functioning of a market. Buyers, unable to observe the energy efficiency of their tenancy within a building, will not place high value on this factor in the purchasing decision. Given this, building owners have little incentive to make improvements when the value of these improvements cannot be passed on in terms of a higher price.

Hence, information asymmetries exist if energy efficiency cannot be proven. However, independent energy efficiency assessments can be readily made and a building efficiency management group established, so the ability of the vendor to conceal the energy properties of a tenancy from a potential buyer or tenant appears to be limited. An exception would be in buildings where individual tenancies are not metered. The solution to that situation is to install meters so that information can be collected to remove any residual information asymmetries.

7.3.4 SEARCH COSTS

Search costs relate to the above problem of asymmetric information or more generally to a lack of information on the side of the prospective purchaser or tenant. If information on building energy efficiency is not disclosed by the seller or owner, it is up to the prospective purchaser or tenant to find the information. Provided the information can be obtained (as discussed above), the next issue is the cost to access this information. While owners or sellers would be able to conduct an energy efficiency assessment once (e.g. at the point of sale or lease), it would be more costly for each prospective purchaser or tenant to get an assessment for each property under consideration. If the prospective purchaser is interested in finding an energy efficient building (and energy efficiency is but one of many building characteristics considered by a prospective purchaser or tenant), substantial time and other costs may need to be invested when the market does not report the efficiency of buildings—though this is not unique to energy efficiency (e.g. buyers will typically obtain a termite inspection before buying a house or a motorist association inspection before buying a second hand car, which happens without the need for government intervention).

Given the proposed threshold of 2,000sqm, the buyers and sellers are likely to be large sophisticated businesses. The *Trade Practices Act* uses a threshold of $40,000 to determine the point above which a buyer can be expected to conduct their own due diligence (rather than relying on statements and claims by the vendor) before making a purchase. Properties with a size of 2,000sqm would be valued in the millions so are certainly above the *TPA* threshold. The annual energy costs within the total occupancy costs may fall below the threshold at which 'buyer beware' does not hold. Even so, over the course of a normal lease period, the cost of energy is sufficiently high for prudent businesses to examine each property sought.

Anecdotally, businesses are becoming highly aware of climate change and energy efficiency issues. Many Boards now demand the assessment of potential risks and exposures that may impact their respective companies from higher energy costs and climate change polices because of the risk management role of company Boards. These issues are well and truly on the radar around Australia's Boardrooms. If it were felt this message still needs to be further reinforced, the Government could conduct a targeted awareness campaign through the Australian Institute of Company Directors.

7.3.5 PRINCIPAL AGENT PROBLEM (SPLIT INCENTIVES)

Principal agent problems relate to the inefficiencies that arise when two parties engaged in a contract have different goals and different levels of information. In other words, there is a mis-match between the incentives and information facing the 'agent' who makes the decision and the 'principal' who is affected by that decision. In the commercial building sector, the principal agent problem relates to split incentives between investors and energy end-users (e.g. between a landlord 'agent' and a tenant 'principal'). Split incentives affect the decision making process.

The commercial building sector is characterised by fragmentation within sections of the value chain and non-integration between them (refer to Figure 7.9). Incentives to reduce energy use are usually split between different players and not matched to those who can save the most through energy efficiency. In addition, there is little opportunity for users to provide feedback through the market to developers or designers. The problem may even exist if all the parties involved are potential beneficiaries from increased energy efficiency, as they may not be aware of it due to lack of information.

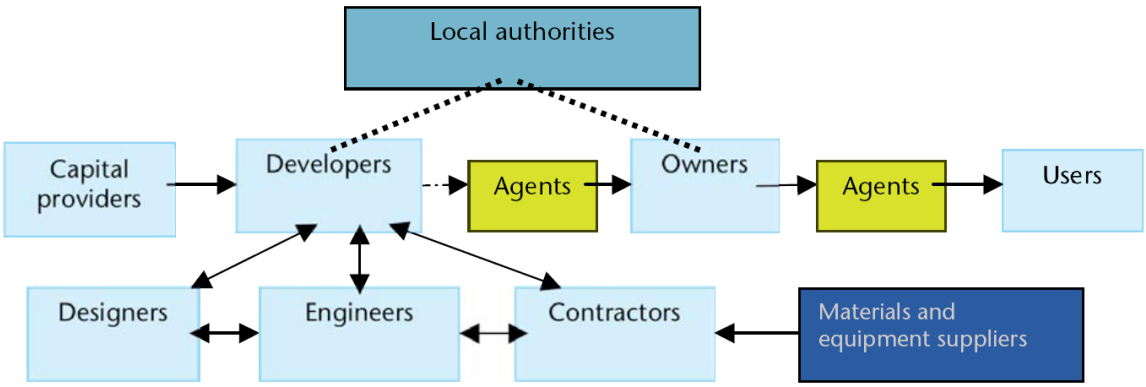

Figure 7.9 Complex Value Chain (WBCSD 2007)

If the operators of a building are not the same group responsible for financing, development, design and development of a building they may not be interested in energy efficiency measures, due to potential higher capital costs of sustainable materials and technology, and reduced investment returns if the building is to be on-sold (unless the market consciously values green buildings). Furthermore, the owner may not be interested in installing energy efficiency measures if the tenant receives the savings.

As Figure 7.10 illustrates, principal agent problems in the commercial building sector can take on different forms depending on who pays for the equipment and who pays the energy bills. From an end-user perspective, Case 1 is no principal agent problem as principal and agent are the same entity. Case 2 shows an efficiency problem as the agent selects and uses

the technology while the principal pays for the energy use. In Case 3 and Case 4, the end user does not pay the energy bill which produces a usage and efficiency problem (case 3), as well as a usage problem (Case 4) (Murtishaw & Sathaye 2006, IEA 2007).

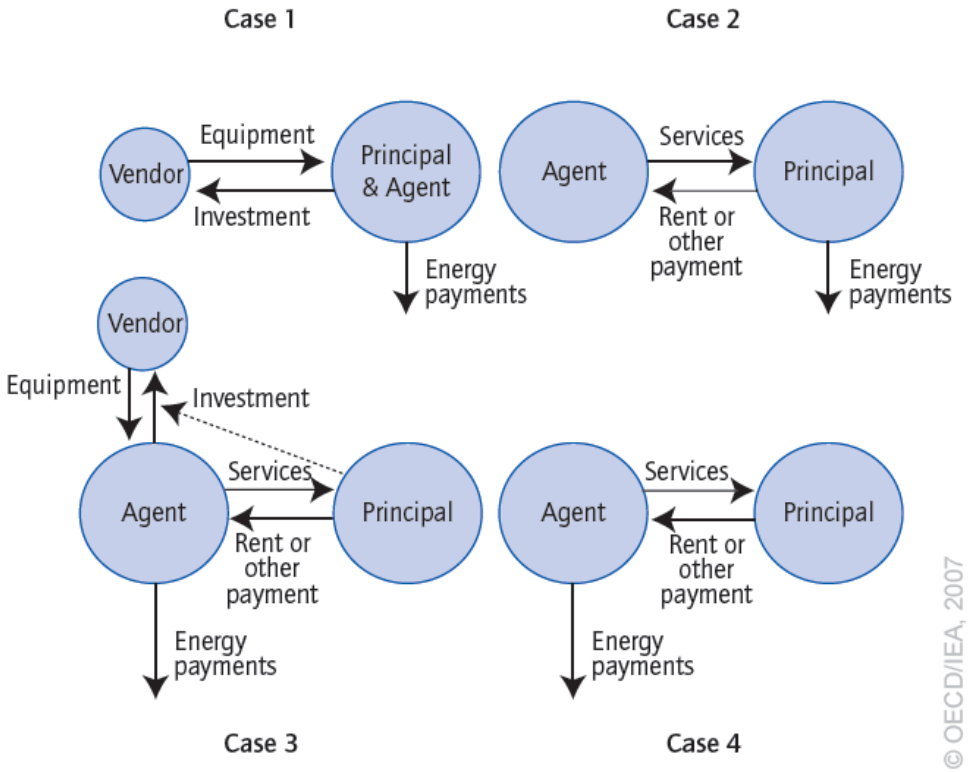

Figure 7.10 Four Principal Agent Problems (IEA 2007)

7.3.6 FREE RIDER PROBLEM

Free riders are agents who consume more than their fair share of a resource or shoulder less than a fair share of the costs of its production. The free rider problem can be an issue in commercial buildings with multiple tenants as the bill for general energy use is split between multiple parties. While each tenant pays for the energy use related to their office or unit (e.g. office equipment, office lighting etc), the costs of central amenities energy used (e.g. ventilation, lift operation, central lighting etc) is split between all tenants.

If a tenant uses those central amenities excessively, the others will have to pay more than their fair share of the bill as this energy use related to central amenities cannot be measured. Hence, that tenant is free riding on the remaining tenants. If a tenant uses energy in their office excessively (e.g. by operating a call centre rather than using the space as an office), they may excessively impact on central amenities such as ventilation which are cost-shared between all tenants. This is especially problematic if a building is designed to achieve a certain average energy use. A single tenant may negatively impact on the building's energy efficiency by being an excessive burden on equipment which would decrease its life-span and increase the energy costs for all tenants.

7.3.7 OTHER MARKET BARRIERS AND IMPEDIMENTS

Energy efficiency depends on awareness of the issue, as well as the ability and the willingness to act on it. While awareness is generally high (although there may be some underestimation of the contribution of commercial buildings' energy use to climate change), actions are

limited. Market failures themselves are special cases of market barriers and impediments. Aside from the market failures discussed previously, there are a variety of barriers and impediments that prevent the widespread introduction of energy efficiency measures (WBCSD 2007, Productivity Commission 2005, McCartney 2007):

- **Cost barriers** - People may be deterred by high upfront costs for materials, products and technology required to increase energy efficiency (in refitting and conversion of existing buildings or the construction of new buildings—although this should be of limited importance as commercial property owners are sophisticated investors with good access to capital markets and can borrow to invest in financially viable energy saving measures), they overestimate the costs premium for energy efficiency measures or are unwilling to invest in energy efficiency measures due to split incentives.
- **Conservatism** - People are unwilling to take a leadership role and adopt new practices as soon as they become available and, instead, wait until practices are tried, tested and more standardised.
- **Risk and uncertainty** - Investment in energy efficiency measures in the commercial property sector is seen as risky due to the unpredictability of costs and actual savings from the use of energy technologies, uncertainty about appropriate discount rates, the potential for increased liability and the possible failure of sustainable materials, products and technology, as well as the unpredictability of climate change impacts and future energy prices.
- **Inconsistency** - Contradictory policy, guidelines and requirements at the various levels of local, state and Commonwealth government may hinder the introduction of energy efficiency measures.
- **Inertia, habit and lack of concern** - People may resist new technologies or may simply leave lights on, not adjust heating etc, despite their knowledge of how to be more energy efficient.
- **The rebound effect** - The expected effects of energy efficiency improvements may be reduced as energy savings may lead to greater use of the same product or use of other energy-using products. Depending on the device concerned, the rebound effect may be as high as 50%.[12] Moreover, firms may substitute away from other inputs towards energy or may respond to lower unit costs of production through expansion.

7.3.8 SUMMARY OF POTENTIAL MARKET FAILURES

This section has identified a number of potential sources of market failure that may result in the amount of energy efficiency and, therefore, the abatement achieved is less than the socially optimal amount. These can be divided into two main groups: those which prevent privately cost effective expenditure (i.e. 'no regrets' options) and those that prevent expenditure that is socially (but not privately) cost effective. These market failures are likely to be present to varying degrees and policies should be addressed at those that produce the largest costs.

The largest market failures and those that need to be addressed primarily are:

- The lack of information about cost effective energy savings.
- The externality caused by greenhouse gas emissions.

[12] The rebound effect ranges from 10% to 30% in space heating, from 0% to 50% in space cooling, from 5% to 20% in lighting and from 10% to 40% in water heating (Productivity Commission 2005, WBCSD 2007).

Split incentives are also of concern if the costs of improvements cannot be passed onto those who benefit from them. The remaining market failures appear to be small relative to the ones listed above. Asymmetric information is a problem to the extent that the search costs are too high to justify an energy assessment. However, because energy assessments (reporting an ABGR rating) cost around $2,000, the cost of obtaining this information is only a small proportion of the total cost of building occupancy and energy consumption. Hence, it does not appear to be a major source of failure for the sector. Further, the free rider problem is separate from the emissions issue and is not easily addressed by the policies considered. Nor is it likely to be large enough to warrant government intervention.

The next section discusses each of the identified policies. It assesses each policy against its ability to correct the three main market failures discussed above. The final section discusses the costs to implement the policies and allows both the costs and benefits of each policy to be considered.

7.4 POTENTIAL POLICY INTERVENTIONS

7.4.1 REVIEW OF THE OPTIONS

Section 7.3 discussed the market failures present in the commercial building sector that may justify government intervention. The three main failures outlined were the general lack of awareness in the privately profitable energy saving opportunities available, the externality created by energy use when the emissions impact on society as a whole (but are not paid for by the individual user), and the inability of building owners to harvest the benefits of any improvements made. This section considers the policies proposed by the AGO in light of these failures.

NO INTERVENTION (I.E. DO NOTHING OTHER THAN BROAD-BASED ETS)

The business as usual (BAU) scenario assumes that no policies are implemented other than a broad-based economy-wide ETS which places a cap on emissions for the whole country. It is a useful counterfactual against which to consider the alternate options. It also raises the question of the validity of alternate policies in the face of an ETS.

It is important to realise that the BAU scenario does not imply that emissions continue along their current trend. While Section 2 discussed forecasts of the BAU emissions, with one report estimating increases from 60 Mt of CO_2 currently to 100 Mt by 2030, this will depend on the degree of take-up of 'no regrets' energy saving options. While this take-up may currently be low, Figure 7.5 highlights that technology takes time to diffuse throughout industries. Hence, it is likely that over time building owners will become increasingly aware of these opportunities even without government intervention. If this were the case, the market failure caused by the lack of information would resolve itself, with little or no call for government intervention.

However, this case is unlikely given the apparently large availability of 'no regrets' options not currently taken up. It is also difficult to estimate the timeframe this diffusion effect would require. Given the urgent calls for action on climate change, it is considered that the BAU scenario would still leave substantial room for a bring-forward of cost effective improvements within the near future (that may otherwise take several years to occur). While it is beyond the scope of this report to provide an estimate of the likely level of BAU emissions, it is noted that the benefits of bringing something forward a few years sooner (than would otherwise

occur) is of relatively marginal benefit compared with causing something to happen that would otherwise never occur.

It is becoming increasingly likely that an economy-wide ETS will be implemented within the next few years. This will be a policy implementation exercise of similar magnitude to the implementation of the GST and, as such, will be the topic of discussion around every water cooler, Boardroom table and in every taxi. As such, a lack of awareness of the need to act on climate change and energy efficiency is unlikely to be an issue.

An ETS will place a price on carbon which will be felt in the building sector through an increase in the price of electricity. The effect of this will be two-fold. Firstly, it will increase the number and value of 'no regrets' options (i.e. the higher cost of electricity will increase the benefits from already profitable energy saving improvements). It is likely that this would speed up the diffusion effect of cost effective technology. The widespread publicity associated with the introduction of an ETS would make people generally more aware of energy use in all aspects of their business and home life (just as current water restrictions in many cities have made water usage a major topic of conversation for people). Secondly, the ETS will make improvements that were not initially privately cost effective. This is shown in Figure 7.8 above where an ETS with permit price *C* would result in abatement action increasing from *B* to *A*.

A major benefit of an ETS is that it would result in energy saving initiatives being taken if, and only if, it is socially optimal to do so. If a tonne of CO_{2e} trades at a price of, say, $30, then abatement will occur in the commercial building sector only if the net cost is less than $30 per tonne of CO_2 saved. If the improvement is more expensive then the building owner may be willing to absorb the cost of higher electricity rather than invest in an expensive abatement scheme which could be more efficiently taken elsewhere in the economy.

Even so, it is likely that 'no regrets' options will continue to be foregone into the near future, even if they are realised in the long term. An ETS is likely and will go some way to mitigate the market failures present in the commercial building sector. However, there are several other policies available which may speed up energy savings and more directly target the relevant emitters. These are discussed below.

AWARENESS RAISING MEASURES

The least interventionist measures are those which do not directly mandate changes but, instead, aim to raise awareness of the failures and leave the market relatively self regulated. If a large amount of abatement can be achieved through 'no regrets' investments then such policies may be effective. Several such policies are available.

One approach would consist of the government stating its intention to closely monitor the emissions from the commercial building sector and making it clear that if progress was not made then more prescriptive action would be taken in the future. Collecting data from the industry and benchmarking this against relevant international sectors would signal to industry the intent of the government's actions. Businesses would be faced with the decision of making improvements now or facing even more regulation in the future.

A staged approach that moves along a continuum from light handed to progressively more heavy handed interventions (with progression only occurring if light handed regulations are not sufficiently effective) gives the government a powerfully credible threat of more onerous

regulation if progress is not made and allows the behaviour of commercial building sector under an ETS to be treated as 'innocent until proven guilty'.

Anecdotally, many businesses are starting to conduct risk assessments of how their business might be affected if an ETS comes in. So there is certainly a growing awareness in society that change is coming and businesses need to evolve to the new reality. A recent survey released by IBM (*The Australian Financial Review* 2007) found that 55% of the Australian businesses surveyed had an environmental policy compared to 44% of businesses internationally. Allowing this paradigm shift a few years to work through, while continuing to closely monitor and review the situation, would have merit.

Other and complementary approaches could include more direct strategies to raising awareness of cost effective energy saving opportunities. Pamphlets could be sent to building owners and company Directors. AGO representatives could even approach them in person to discuss the opportunities available and how they could be implemented.

Such policies could greatly help to increase the speed of diffusion of energy efficient technology throughout the commercial buildings sector. They also have the advantage of limiting the extent of the government's intervention. However, they lack the incentives to result in abatement that is socially, but not privately, beneficial and so will not address the market failure caused by emissions externalities (with the ETS being the appropriate policy instrument for this broader issue).

BASIC DISCLOSURE REGIME

Mandatory reporting of energy efficiency has been trialled on residential property in the ACT and could be used to increase energy efficiency of commercial buildings. It aims to include energy efficiency in the pricing decisions which should:

- Overcome any information asymmetry between buyer and seller.
- Provide incentives for building owners to invest in energy saving improvements with the knowledge that these can be passed on in terms of higher rents.
- Raise the general awareness of energy efficiency by highlighting it each time a building is leased or sold.

While mandatory disclosure works well to overcome asymmetric information, as discussed above this is not a major source of market failure in the sector as the information is readily obtainable. The largest benefits of mandatory disclosure results from the awareness it creates of the potential energy savings available and for these to be reflected in the price of a building and the rent charged to tenants. This should overcome the problem landlords face in passing on any improvements in higher prices to those who actually benefit from them.

There is a modest benefit in reducing search costs for potential tenants who no longer have to purchase an assessment themselves but the cost of obtaining an ABGR is insignificant relative to the cost of leasing or buying a commercial property greater than 2,000sqm in area.

There is also the question of whether many property investors or tenants would be swayed by the star rating. While some companies may benefit from being based in an energy efficient building, tenants in highly competitive industries (such as retail, restaurants or call centres) may not be able to afford the additional cost. Perversely, some may search out less efficient buildings to try and save on the rent. In terms of addressing the second market failure, by not mandating or subsidising energy efficiency improvements, and not penalising emissions,

mandatory disclosure would not lead to a reduction in emissions beyond those that are privately cost effective.

Of course, as noted above the presence of an ETS would internalise the externality of emissions on society which may align the private cost effective level with that of society. Hence, mandatory disclosure in combination with an ETS could potentially result in efficient emissions levels. By only requiring building owners to spend around $2,000 on an energy rating it is also less costly than other policy options. Furthermore, to not require any specific action to be taken, the risk of regulatory failure is negligible.

A key factor in the performance of mandatory disclosure is the extent to which the market responds to the additional information it provides. If no premium for energy efficient buildings exists, then the policy does not provide a means for those who make the investment to reap the rewards. Evidence from the disclosure regime in the ACT[13] indicates that the market does in fact respond to energy efficiency, where houses with higher EER values sold for higher premiums. Whether this would hold true for commercial buildings, and whether the premium would reflect a full pass through of the energy savings (as would be required for landlords to face the correct incentives) is unclear. However, it is likely that commercial building prices could be more sensitive to costs than residential buildings and that some degree of pass through would occur.

However, the ABS study on disclosure in residential buildings in Canberra only demonstrated that the market places a value on energy efficiency—not that the act of disclosure itself increases the intensity of this signal or has changed the behaviour of individuals. Hence, it is important to move from an evidence-based approach to disclosure once it is implemented. If the market does not respond to the policy through further premiums on energy efficiency *as a result of disclosure itself* then the benefits of the policy would appear to be small. In such cases, no change in behaviour to energy efficiency would manifest and the benefits of the policy would be small. Hence, data collection both before and after the policy is implemented is essential to analyse the performance of the policy, with analysis focussed on the act of disclosure itself—not how prices react to efficiency.

ENHANCED DUE DILIGENCE

Including the investigation of energy efficiency as part of due diligence proceedings works in very much the same spirit as a disclosure regime and little is added to the previous discussion of that policy. As with mandatory disclosure, due diligence includes the consideration of the energy efficiency of buildings at the time of sale or lease and involves the same benefits and downfalls.

One area where it will differ from mandatory disclosure is in the amount of search costs it entails. While mandatory disclosure requires an energy rating to be conducted by the vendor, enhanced due diligence will require one from each prospective buyer. At a price of around $2,000 each, the costs involved are greater under this regime than under mandatory disclosure so long as more than one potential buyer or lessee is required to make an assessment.

In any case, due diligence is an internal risk management process undertaken by a potential buyer and the degree of thoroughness will vary greatly between cases. The amount of due diligence a company conducts before purchasing a building can vary from ‘kicking the tyres’ to a detailed assessment involving lawyers, engineers and accountants. The ability of

[13] This relates to a forthcoming ABS study on the effect of energy ratings on house prices.

government to enhance an internal company process, which is so elastic in interpretation, appears to be limited.

GREEN LEASE SCHEDULE

To make the GLS compulsory in commercial lease brings the two parties in a lease, the owner and the tenant, together to discuss an approach to energy efficiency. To date, GLS have been voluntary for private sector offices. Of note, while there have been widespread take up for buildings owned or occupied by public sector agencies, there have been limited levels of take up in the private sector.

Awareness of the opportunities for investment potential in energy savings is raised by focussing the tenants and landlords on energy savings in the lease. Importantly, Green Leases also provide a means for landlords to right size their plant and equipment to match the heat loads of the tenant with greater certainty. Tenants may be willing to pay a rent premium so long as the benefits of lower energy costs and an improved work environment are higher than the rental increase. Hence, unlike the previously considered options, GLS provide a direct way of resolving the first and third market failures identified in the previous Section.

In both gross, and in particular net, leases the tenant and owner derive significant benefits from the Green Lease in terms of overcoming building commissioning issues and requiring that the energy efficiency features actually perform as designed. In terms of a net lease, the tenant benefits from the right sized plant and equipment and efficient lower operating costs over the term of the lease as tenants are required to operate and maintain the plant and equipment. The owner benefits from the lower investment arises because the plant and equipment are not oversized due to matching and maintaining heat loads of the tenant and owner.

However, landlords and tenants may agree only on improvements when each party is better off under the arrangement and this may only occur when the improvements provide a net economic benefit. Hence, the GLS may only encourage privately profitable energy investments.

Offsetting the more direct benefits of GLS are the potentially higher compliance costs. However, these costs have been minimised by using the existing reporting structures already occurring in the building management process by only looking at building reports by exception. The GLS has been designed to be attached to the lease in a way that does not place the tenant and owner in immediate breach of the main body of the lease for non performance.

The GLS has its own dispute resolution clauses which is a two stepped process and is resolved by expert determination, with the costs of this process split between the two parties. Assigning fault to the tenant and owner is made easier with separate metering for tenant light, power and central services. An audit trail has been established under the GLS by both parties adopting a detailed energy management plan and building management committee to help address the information asymmetry and supply chain issues. The extent to which dispute resolution would be necessary is unclear, however, consideration to this should be given in determining the costs of this policy.

Again, with no mandated requirements placed on parties beyond the requirement to consider energy efficiency, the chance of regulatory failure is likely to be negligible. GLS, like the policies outlined above, mainly aim to raise awareness of the issue at hand and to provide an

information resource to the marketplace which makes it a minimalist intervention. The policies considered below are more prescriptive in their nature.

ACCELERATED DEPRECIATION, WHITE CERTIFICATES AND SUBSIDIES

The previous set of policies (apart from the ETS) have all had the aim of raising awareness of cost effective energy saving opportunities but lack the clout or incentives to encourage investment in improvements that are socially, but not privately, profitable. That is, they have been aimed at the first market failure of the lack of information but cannot resolve the market failure of the externality due to emissions. For that, a policy is needed which either mandates abatement beyond the privately profitable level or provides price signals which achieve the same result. This section investigates three policies which provide such price-based incentives: accelerated depreciation, White certificates, and subsidies on improvements. However, the discussion could also relate to any tax or subsidy levied on the energy supply chain, such as energy supply subsidies to efficient users or taxes on inefficient consumers.

Accelerated depreciation was common in the early to mid 1990s but has not been used in recent years. It provides incentives for firms to invest by allowing larger amounts of this capital to be written-off as depreciation in the earlier years of its life. The benefit it grants to firms is in bringing forward the tax savings on depreciation, however, it can essentially be thought of as a subsidy on investments in the allowable goods and it is treated as such in this section.

Tax incentives and subsidies, depending on their exact form, may be a means of encouraging activity that the market itself will not partake in. Investment in energy saving improvements is one such case. By reducing the cost (or increasing the benefit) of these improvements they can encourage investment which is socially but not privately profitable, hence, correcting the market failure caused by the externality. In theory, with certain knowledge of the marginal abatement schedule, the tax (or subsidy) could be chosen to result in the optimal level of abatement.

However, in the presence of an ETS, the justification for additional subsidies is unclear. The price of tradeable permits should adjust to achieve the optimal level of abatement with investment occurring where it is efficient to do so. Further incentives in the form of taxes and subsidies are not required, except to the extent that the carbon price implied in the permits does not capture all of the externalities or the market is still not reacting optimally to the price of the permits. In such cases, price signals may be required to encourage the extra investment which is not occurring. In the sense that these measures encourage investment in energy efficiency, they could be used to partially resolve both market failures: encouraging the take up of already cost effective improvements while giving the incentive needed to invest in socially profitable projects.

While one criticism of these policies has already been raised, namely that they are not needed in the presence of an impending ETS, major criticisms focus on the perverse incentives they may create for investment. Accelerated depreciation encourages investment in capital for tax purposes and it is possible that excessive investment occurs for this reason. For example, during refitting builders could inflate the costs of capital components while deflating the cost of other components to allow maximum tax relief. With subsidies the problem exists for determining a suitable reference case for what investment would occur in the business as usual scenario. That is, if building owners are going to be subsidised for energy improvements they are likely to claim the subsidy for themselves, even if these would have been the routine replacement of worn equipment. Transparency and compliance issues thus

come to the fore in such situations and the system would have a high risk of regulatory gaming and cost shifting. For example, the energy efficient components (that are eligible for accelerated depreciation) may be allocated a higher share of overheads than the other non-eligible components within the total refurbishment cost.

Tax expenditures such as accelerated depreciation are also difficult for the government to monitor and the cost to the budget is difficult to assess as no explicit transaction with the government occurs (revenue is simply forgone). As such, it would be difficult to periodically review the 'bang per buck' of the tax expenditure and if it was cost effective in encouraging abatement.

White Certificates have been raised as abatement options in several jurisdictions. Essentially, they allow abatement to be recompensed similar to a permit system, although participants can 'double dip' when they receive both the benefits from the reduced energy consumption and the value of the certificate. They face the same transparency problems of the other price based mechanisms and it is not clear how they complement an ETS when building emissions are already accounted for at their source and passed on through higher electricity prices.

7.4.2 SUMMARY OF THE OPTIONS

The policy options discussed above can essentially be divided into two groups: those that encourage the take-up of cost effective investment and those that encourage improvements that are socially, but not privately, cost effective. Policies that fall into the former category include awareness campaigns, mandatory disclosure of energy rating, enhanced due diligence and GLS. Those that fall into the latter include price incentives such as carbon taxes or energy efficiency subsidies, and direct emissions restrictions such as mandatory energy efficiency levels like those in place for new government buildings.

Another important way of categorising the options is in terms of their degree of prescriptiveness or magnitude of intervention required by the government. General awareness raising measures do not place high demands on either the government in terms of measuring compliance or on affected individuals. However, they are also the least likely to achieve significant action. Disclosure regimes and GLS are more prescriptive and require more resources in ensuring compliance with GLS being the more costly of the two. Perhaps the most prescriptive of all are price signals and mandatory emission targets. These are costly to both the firms who face these policies and the government agency that enforces them. Given the possibility of firms 'gaming' the regulator by exploiting loopholes, substantial resources may need to be expended to ensure compliance with the spirit and letter of the law.

The possibility of regulatory failure is also a necessary consideration in this regard. Figure 7.9 illustrates the possible consequences when there are uncertainties around the costs firms face in making energy saving improvements. This uncertainty may mean that overly prescriptive policies place excessive and undesirable costs on businesses while price based policies may not result in the required level of abatement. Light-handed intervention is preferable in these cases, at least initially, to avoid the risk of regulatory failure.

7.5 QUANTIFICATION OF THE OPTIONS

The previous sections have discussed the options available to reduce emissions from the commercial building sector. The option chosen should be that which maximises the net

benefits of taking action where the net benefits are the sum of private and social benefits less costs:

Net Benefits = (Private Benefits – Private Costs) + (Social Benefits – Social Costs)

Each of these components is considered in detail below. In brief they may include:

- Private Benefits - these are the reduced costs of energy from occupying a more energy efficient building and any other benefits created such as business kudos or staff productivity from working in a more responsible office environment.
- Private Costs - are the costs associated with installing, operating and maintaining the energy saving equipment.
- Social Benefits - are the benefits from increased energy efficiency which are not privately realised. They are the benefits associated with reduced emissions where these benefits cannot be captured through pricing CO2e.
- Social Costs - are any costs for implementing a scheme above those faced privately. They include the administrative costs of implementing a scheme, as well as any economic effects external to those on whom the policy is placed (e.g. the social costs of emissions in the construction of energy saving equipment that cannot be captured through pricing carbon).

Private benefits and costs relate to the financial viability of a potential investment. If the value of the first bracket in the above equation is positive then it is referred to as a 'no regrets' investment. It is an investment which will provide a net financial return to firms involved.

The social net benefits, the terms in the second bracket, are perhaps more difficult to isolate. When there is no price placed on carbon in the economy the value of the *Social Benefits* term will be zero[14]. In the presence of a carbon pricing scheme, the value of abatement in the commercial sector will be equal to the price of permits for that amount of CO_2 equivalent emissions. That is, emissions reduction in the commercial building sector reduces the amount of abatement needed to be achieved elsewhere. The social costs refer to the costs of policy implementation which, as discussed below, will vary between the options.

This section discusses each of the terms in the equation above in turn and, in doing so, points at how each of the policies could be roughly costed. It begins by discussing the two terms in the first bracket which make up the private investment decision of whether an investment is 'no regrets'. It then discusses the costs of implementing each policy which enter into the equation through the *Social Costs* term. Finally, the effects of an ETS on the cost of energy are discussed, where placing a price on carbon attempts to capture the social benefits of abatement and is internalised into the private decisions of those who invest in energy intensive equipment.

7.5.1 THE PRIVATE BENEFIT COSTS CALCULATION

A landlord faced today with the decision of whether or not to upgrade existing plant and equipment to be more energy efficient will do so only if the present value of energy savings outweigh the costs of the replacement. Figure 7.11 gives an idea of the potential energy savings available from increasing the efficiency of a building. This illustrates that increasing the star rating of a building by one star results in an energy bill saving of around $3 per square

[14] While the country will receive the benefit of reduced emissions on the climate, this is almost negligible for a country such as Australia given its relative share of global emissions.

metre annually. Estimates from Team Catalyst energy consultants place the cost of upgrading a building from two to three stars at around $61 per square metre. Comparing the costs with the benefits does not make energy efficiency seem an appealing option at normal commercial property investor discount rates.

Figure 7.11 Benefits of increased energy efficiency (Investa 2006)

However, equipment and plant has a finite life and need to be replaced periodically. Hence, in determining whether or not an energy efficient system is cost effective, the appropriate counterfactual is the cost of replacing the plant with the less efficient equipment. That is, if a landlord is facing the need for replacement in any case, the cost is not the entire $61 above but the amount that this exceeds the investment needed if the equipment is replaced with less efficient devices. This excess may be dubbed the 'energy efficiency premium' and is the price the market places on energy efficiency in equipment. The net benefit for a landlord replacing worn equipment with energy efficient devices over less efficient devices is then:

$$Net\ benefit = NPV\ of\ energy\ savings - Energy\ efficiency\ premium \qquad \text{or;}$$

$$Net\ Benefit = \sum_t \frac{Energy\ Saving_t}{(1+r)^t} - \left(C_{Efficient} - C_{Inefficient}\right)$$

Where '*r*' denotes the interest rate, '*t*' refers to the time periods over which the equipment is effective, $C_{Efficient}$ is the cost of the efficient equipment and $C_{Inefficient}$ is the cost of replacement with inefficient equipment. For example, suppose an efficient air conditioner with a life span of 20 years can increase the energy efficiency of a building by half a star and costs $30,000 while an inefficient air conditioner costs only $20,000. Then, for a 1,000 square metre office, the net benefit from the efficient air conditioner per square metre, assuming a 7% real discount rate, is:

$$Net\ Benefit = \sum_{t=1}^{20} \frac{\$3 \times \frac{1}{2}}{(1+0.07)^t} - \frac{(\$30{,}000 - \$20{,}000)}{1{,}000 m^2} = \$5.89\ per\ m^2$$

For the office as a whole this gives an annual energy saving of just under $600. While this may look appealing, it assumes that the equipment required replacement in any case. In reality a landlord faced with the option of improving energy efficiency may face several years before equipment is due to be replaced. In this case, bringing forward the date of replacement imposes additional costs. These can be measured as the return which could have been earned on the capital spent on the equipment over the period of time until replacement was necessary.

For example, suppose the current air conditioner was installed five years ago and has a useful life of 15 years. Then the $30,000 which would be used to purchase the new air conditioner could have been invested at 7% for these 10 years and earned around $29,000, or $14,750 in present value terms. The net benefit to the landlord from installing the more efficient air conditioner now becomes:

$$Net\ Benefit = \sum_{t=1}^{20} \frac{\$3 \times \frac{1}{2}}{(1+0.07)^t} - \frac{(\$30{,}000 - \$20{,}000)}{1{,}000 m^2} - \frac{\$30{,}000\left(1.07^{10} - 1\right)}{1.07^{10}} = -\$8.86\ per\ m^2$$

The last term in the equation above is the present value of the interest which could have been earned on the $30,000 if the landlord had replaced the asset at the end of its life instead of now. It is a measure of the sunk cost of the capital spent on the air conditioner currently in place. The result of this cost is to turn the expenditure into a net loss for the landlord. In fact, it is not until replacement is only three years out that the investment becomes cost effective in this case.

The analysis and examples above indicate that there are three important factors in determining whether investments in energy saving plant and equipment are cost effective:

- The amount of energy saved.
- The cost premium of energy efficient equipment over less efficient equipment.
- The remaining life of the equipment or plant currently in place.

The energy bill saving from installing more energy efficient equipment is the driver for these ‘no regrets’ changes. The $3 per square metre value used above was checked with energy consultants Team Catalyst to gain their view on whether this is indicative of the savings which can be expected. They reported previous calculations which estimate a saving of $6-$7 per square metre for a building moving from two to four and a half stars. These two estimates are roughly equivalent on a per star basis. Team Catalyst was also asked about the cost premium attracted by energy efficient equipment. They stated that this premium varied between equipment but rough values of a 10-15% premium could be expected.

As illustrated in Table 7.1, the key appliances used in buildings are long lived assets, most of which are replaced once every two decades. As such, issues of avoiding policy responses that result in stranded assets and allow sensible timeframes for the natural replacement cycle are likely to be more cost effective.

Equipment	Lifespan (years)
Air conditioning unit	7-15
Boilers	15-30
Cooling towers	10-25
Electrical equipment (motors, heaters, and cables)	20-30
Fans	15-20
Generators (electric and diesel)	15-20
Lighting installations	20-25
Radiators – hot water	20-25
Refrigeration	15-30

Table 7.1 Lifespan of building equipment (AIRAH 2000)

As well as the direct costs of equipment, additional costs may be incurred if help is sought from energy consultants. For example, energy audits that return a star rating cost around $2,000 while the extensive involvement of consultants to increase efficiency may cost upwards of $20,000. These costs are reflective of the informational barriers present in the sector where building owners are unaware of the presence or means of efficiency improvements. When the policies discussed above encourage action to be taken, the costs of consultants in this process should also be considered.

7.5.2 THE EFFECT OF AN EMISSIONS TRADING SCHEME

Emissions trading schemes attempt to internalise the costs of emissions (benefits of abatement) into the decisions of individual firms and consumers. There are several designs of such schemes. However, they predominantly work by levying a charge on emissions at the point of creation. Electricity suppliers pass on some of this extra cost to consumers in terms of higher prices for electricity. As discussed above, a reasonable expectation of the effect of an ETS would be for retail electricity prices to increase by around 12%.

The effect of an ETS on the level of investment in energy efficiency will manifest in two ways:

- It will make some relatively expensive technology become cost effective.
- It will bring forward the date at which investments in energy saving plant and equipment become cost effective.

Using the numbers above, consider a carbon price which results in a 12% increase in electricity prices. Here, the saving of increasing the star rating of a building by one star rises from $3.00 to $3.36 per square metre. This would have the effect of increasing the net benefit in the equations above by $1.91 per square metre. Furthermore, it was noted above that the investment analysed would not become cost effective until three years out. With the ETS in place, this would bring the date forward by one year which would make it cost effective four years out and illustrate the second of the dot points above.

7.5.3 COSTS ASSOCIATED WITH THE POLICIES

The policies that encourage the take up of 'no regrets' investments (discussed in 7.4), create costs of their own. These arise from two sources:

- The relative administrative and compliance costs on the government and individuals.
- The potential costs of regulatory error where the policies distort the optimal allocation of resources in abatement activities.

The latter point is difficult to quantify and, in any case, will only be realised *ex post*. However, given the potential for these costs, preference is to be given to light-handed regulatory approaches which minimise the probability of regulatory error. The former costs are more transparent and this section attempts to place some values on the costs for each of the policies. It is not possible to place numerical values on the costs in many cases as they will only be realised over time or are not financial in nature. This is perhaps most pertinent for taxes and subsidies where the costs result from an inefficient allocation of resources over time and high administrative costs, with low direct costs falling on individuals. The table below compares the costs under mandatory disclosure (and due diligence) versus Green Leases.

Mandatory Disclosure	**Green Leases**
1. Cost of AGBR assessment: $2000	1. Cost of ABGR assessment: $2000
	2. Legal fees associated with lease
	3. Cost of time spent on lease
	4. Cost of dispute resolution

Table 7.2 Comparison of the costs of mandatory disclosure with Green Leases

Mandatory disclosure requires the achievement of an energy rating. Discussions with energy auditors revealed that an audit returning an ABGR rating costs around $2,000. No further costs are faced by those affected by the policy, however, administrative costs to the Government may be large. The extent of these costs will depend on how the policy is rolled out and the amount of monitoring required. More precise estimates should be made in order to adequately weigh the costs and benefits of these policies on an ongoing basis. If disclosure achieves little in improving energy efficiency then the administrative costs are likely to justify its cessation as a policy. However, it is worth noting that while these costs would run into the millions of dollars, the benefit to the economy from a policy which reduces emissions by 1Mt is around $40 million, based upon a $40 per tonne permit price.

Green Leases are more prescriptive in their requirements. The costs include the following:

- An energy audit to assess the initial energy efficiency of a building. As mentioned above, this would cost around $2,000.
- Legal fees associated with completing the lease. Discussions with the AGS revealed that it is difficult to place a value on this and it would depend on the form of the lease adopted and the degree of advice sought (but would be non-zero).
- The time required in meetings between the tenant and landlord, as well as time spent on understanding and processing the lease. While not financial costs, managers place a high value on their time and these costs can add up to a substantial amount.

- Dispute resolution costs. While Green Leases have been designed to encourage cooperation and limit the chance for litigation, they do provide for dispute resolution. In such circumstances, experts may be called in to assess the situation with the parties sharing this cost. Information on the costs of resolution and the frequency with which it is required would help in quantifying this factor.
- As with a disclosure regime, the administrative costs to the government could be large and should be considered in detail to ascertain the net benefit of this policy.

There is also likely to be a one-off cost during the first few years as landlords and tenants become acquainted with Green Leases. All in all, Green Leases would appear to place the same costs on participants as mandatory disclosure or due diligence, plus any additional costs outlined above. The lower costs imposed by a disclosure regime would suggest that this is preferable to Green Leases, at least initially. However, it is also important to include the costs to the government for the implementation of these schemes and such differences here could tip the balance in relative costs. If disclosure is found not to achieve a sufficient change in behaviour then mandatory Green Leases or more prescriptive policies could be considered.

8 CONCLUSION

TECHNICAL AND ADMINISTRATIVE

Rating the energy efficiency of commercial buildings for disclosure is extremely complex. The issues that affect the technical capacity to rate the energy efficiency of commercial buildings include the size, nature and diversity of commercial buildings, the different leasing arrangements, the availability of sufficient energy data, suitable tools and trained assessors.

While energy analysis software is available for predicting the theoretical annual energy consumption of commercial buildings, the only tool that adequately benchmarks the actual energy efficiency of commercial buildings is the ABGR scheme. A major drawback of this scheme is that it only rates office buildings. If a disclosure scheme were to be introduced to cover all types of commercial buildings, an assessment tool would need to be developed for Class 3, 6, 7, 8 and 9 buildings.

Verification Method JV3 of the BCA could be used to benchmark the energy efficiency of a wider range of commercial buildings. However, this would require the development of an accurate method of correlating the predicted and actual level of energy efficiency.

As an alternative to the ABGR scheme, a proposed methodology for the establishment of a disclosure scheme is detailed in Appendices B, C and D. This methodology has been designed to facilitate the development of assessment tools and energy efficiency benchmarks for all commercial building types. The scheme caters for either basic or detailed disclosure of the energy efficiency of buildings depending upon the availability of energy data across the sector of a particular building type.

A mandatory disclosure regime must be underpinned by an administrative framework that supports the technical processes. In this regard, an administrative body needs to be established to oversee the implementation and ongoing development of the regime. In broad terms, the administrative body would be responsible for maintaining the credibility and long term viability of the regime.

INTERNATIONAL

Internationally, there is a variety of approaches to improving the energy efficiency of commercial buildings. The common theme among jurisdictions is that government incentives for refurbishments and upgrades are favoured.

Some form of energy efficiency disclosure exists in most jurisdictions because energy efficiency information is required to receive incentives. However, few jurisdictions have implemented mandatory disclosure for commercial buildings.

The UK has the most rigorous mandatory disclosure scheme which is based on EU's certification scheme, EPLabel, and is due for a staged implementation over the next three years. For most commercial buildings, an EPC is required whenever a building is constructed, rented or sold. The certificate will provide a rating of the energy efficiency and carbon emissions of a building from A to G, where A is very efficient and G is very inefficient.

LEGAL

This report demonstrates that while a Mandatory Disclosure scheme and a mandated GLS compliance scheme are possible from a 'technical' legal process perspective, there are a range of tasks to be undertaken before further legal consideration on the viability and structure of the regimes can be provided. These tasks are briefly summarised below.

Further analysis and consideration of the practical, operational and economic considerations that will underpin the proposed schemes

This report highlights the need to assess or determine:

a) A clear definition of the types of buildings which are to fall within the scope of a Mandatory Disclosure scheme or a mandated GLS compliance scheme.
b) The nature, scope and process for exclusions or exemptions from those schemes
   - in the case of a Mandatory Disclosure scheme where a party is to disclose relevant information (important in leases because the conduct of both parties can impact upon the performance, degree and type of information control which varies between the parties).
   - in the case of a mandated GLS compliance scheme this will deal with the separation of responsibilities and the extent of accountability.
c) In the case of a mandated GLS compliance scheme
   - the nature of the rating or performance standards and the impact of these in terms of consistency, reliability, ease of use and cost.
   - the allocation of responsibility and cost between landlord and tenant. In particular, this includes the questions of up front costs for leasing such as building and plant upgrade and through life costs such as repair and maintenance obligations and costs associated with complying with the scheme.
   - the extent to which responsibility can practically and clearly be apportioned between a landlord and tenant, and how issues of 'contribution' or 'causation' of non compliance by the other party or third parties are to be identified and resolved. Commercial buildings are not a static commodity and many factors will impact. Compliance or non compliance may be difficult to establish.
d) In the case of both schemes, what remedies or penalties are to be available for failure to disclose or comply.
e) How do the mandated schemes compare in terms of outcome, acceptability and cost with alternatives such as incentivisation and market forces.

Effective and more widespread stakeholder consultation

Not only will State and Territory representatives need to be engaged, to develop the framework further, it will also be necessary to consult interested stakeholders. In addition to landlord and tenant representatives, other areas for input include planning, building, engineering, maintenance, design, assessment, valuation and building management, as well as financial input.

Agreement on the fundamental benchmarks and processes - 'the what and how' of disclosure

This involves the following:

a) Identify exactly what information is to be disclosed.

b) Identify the extent to which form of disclosure is to be regulated (the degree of detail and the format).
c) Identify the frequency of disclosure (e.g. the situation at sale is straightforward but lease options range from one off disclosure through to ongoing disclosure through the life of the lease, on any extensions or options of renewal).

Intra-government and inter-government consideration of the scope of the legislative requirement and decisions on which legislative framework is preferred.

The creation of a legislative framework would proceed on a co-operative basis between the Commonwealth and the States and Territories. The consultation process will not only cover what will be included in the legislation but also the vehicle to be used (e.g. uniform local legislation or referral of State powers to the Commonwealth to enable the Commonwealth to enact uniform legislation or the use by the States and Territories of existing legislation).

Once the threshold issues have been resolved more specific legal advice can be sought on how best to achieve the agreed outcomes.

ECONOMIC

An increased focus on energy efficiency in the commercial buildings sector has resulted from greater attention to climate change issues and the publication of reports on the potential for cost effective 'no regrets' investments. Estimates of the size of these opportunities vary upon the modelling assumptions used, however, a fruitful approach is to accept that these may be sizeable and then address those factors that have lead to the failure of market take-up.

The market for commercial buildings greater than 2,000 square metres is made up of sophisticated investors who are aware of the costs implied in building operations. Such buildings and the plant in those buildings easily surpass the $40,000 threshold in the *Trade Practices Act* where people are presumed to be able to conduct their own investigations into the suitability of potential purchases. Against this backdrop, the evidence that easy cost savings are being ignored would suggest that there are barriers, or market failures, which are impeding energy efficiency in the sector. Aside from the externalities caused by greenhouse gas emissions, the main market failures seem to be based on informational issues which may be addressed by policies.

Given the above, less prescriptive policies, such as an information campaign and the promotion of voluntary disclosure and GLS, would be implemented first. These would also allow time for data collection (a major gap is knowing the actual number of buildings >2,000 square metres) while signalling to the market that energy efficiency in commercial buildings is an area of policy interest. An ETS would also encourage action, albeit with calculations that show this will only add slightly to building operating costs. If the market is seen not to respond to these signals, or if progress is too slow, then more prescriptive policies could be considered.

However, it is not clear *ex ante* the extent to which disclosure would achieve meaningful increases in building energy efficiency. Equally, data limitations and the heterogeneity of commercial buildings mean that it cannot be conclusively proven (at this stage) that mandatory disclosure would be completely ineffective.

Before this policy is implemented, data should be collected and analysed to assess the affect of mandatory disclosure on behaviour in the commercial building sector. A lack of precise

information and a strong desire by the community to improve energy efficiency, combined with the moderate compliance costs of disclosure implementation, suggests that this policy comes at a moderate cost and brings potential upside. But once implemented, the policy will need to be monitored closely to ensure the upside claimed actually eventuates.

APPENDIX A - BUILDING CLASSIFICATIONS

Clause A3.2 of Volume One of the BCA (ABCB 2007) describes Class 3, 5, 6, 7, 8 and 9 buildings as follows:

Class 3: a residential building, other than a building of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons, including-

(a) a boarding-house, guest house, hostel, lodging-house or backpackers accommodation; or
(b) a residential part of a hotel or motel; or
(c) a residential part of a school; or
(d) accommodation for the aged, children or people with disabilities; or
(e) a residential part of a health-care building which accommodates members of staff; or
(f) a residential part of a detention centre.

Class 5: an office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.

Class 6: a shop or other building for the sale of goods by retail or the supply of services direct to the public, including-

(a) an eating room, café, restaurant, milk or soft-drink bar; or
(b) a dining room, bar, shop or kiosk part of a hotel or motel; or
(c) a hairdresser's or barber's shop, public laundry, or undertaker's establishment; or
(d) market or sale room, showroom, or service station.

Class 7: a building which is-

(a) Class 7a – a car park; or
(b) Class 7b – for storage, or display of goods or produce for sale by wholesale.

Class 8: a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale, or gain.

Class 9: a building of a public nature-

(a) Class 9a – a health-care building, including those parts of the building set aside as a laboratory; or
(b) Class 9b – an assembly building, including a trade workshop, laboratory or the like in a primary or secondary school, but excluding any other parts of the building that are of another Class; or
(c) Class 9c – an aged care building.

APPENDIX B - PROPOSED MANDATORY DISCLOSURE SCHEME (BASSETT APPLIED RESEARCH)

1.0 Introduction

In this section, a process for the implementation and ongoing development of a national mandatory disclosure regime for commercial buildings is presented.

This scheme comprises of four phases as presented in Figure B1. Each phase carries a greater level of complexity, starting from a preparation and baseline data collection phase and moving towards more complicated data analysis and building assessment phases.

Each group of buildings sharing a classification or sub-classification in accordance with the BCA (refer to Appendix A) will be referred to as a Disclosure Group. Each Disclosure Group will operate in a phase that is commensurate with the level of energy data available and the benefits that may be achieved through the level of assessment carried out.

Under this scheme, it is proposed that each Disclosure Group will progress through the described phases as far as the intended outcomes of the scheme justify. This is to ensure that the complexity of the scheme matches the economic opportunities available to each Disclosure Group.

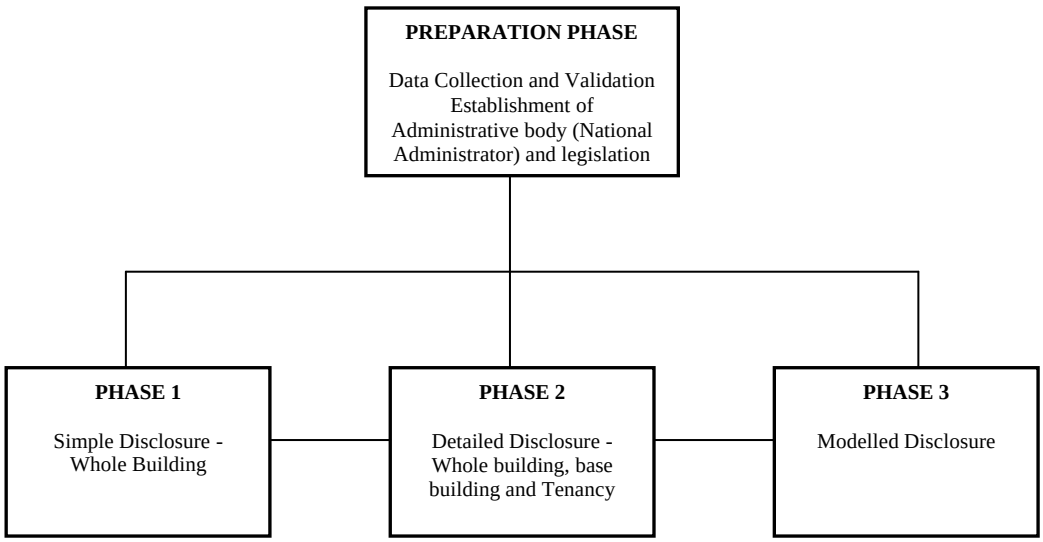

Figure B1 Phases of Implementation

2.0 Basic Description of Phases

2.1 Preparation Phase

The Preparation Phase involves:

- Establishing an Administration Body (National Administrator) and its roles.
- Enacting the required legislation in each jurisdiction.
- Communicating the scheme to government and industry stakeholders.
- Developing appropriate assessment tools for data collection, analysis and benchmarking in the later phases.

- Collecting and validating data.

A statistical spread of data is collected during the Preparation Phase and this data is used for performance benchmarking in the later phases (refer to Appendix C).

2.2 Phase 1: Simple Disclosure (Whole building)

Phase 1 is the first phase of the scheme that requires public disclosure of energy efficiency. A Disclosure Group will enter Phase 1 when there is sufficient data on basic energy consumption (e.g. kWh/m^2) to create a rating scale based on the mean and/or standard deviation of the energy efficiency of the group.

In Phase 1, the energy efficiency rating for a building is achieved by comparing its performance with the statistical spread of collected data and the assessment tools developed during the Preparation Phase. The extent of disclosure will need to be specific to the particular Disclosure Group and will be dependant upon the most cost-effective means by which a desired market impact can be achieved. For example, disclosure of predominantly retail business buildings with uniform usage patterns will be less complex than disclosure for buildings with varying usage patterns.

During this phase, rating bandwidths would be relatively broad to account for the limited detail in the acquired energy consumption data. Refer to Appendix C for more information on rating bandwidths.

2.3 Phase 2: Corrected Disclosure (Whole building, base building and tenancy)

Phase 2 provides for more detailed disclosure thereby accounting for different functions that affect energy use within Disclosure Groups. This includes multiple tenancies where there is sufficient sub-metering to separate the major energy uses in a building. The progression to Phase 2 will be dependant upon the detail of data collected. As in Phase 1, the extent of disclosure will be specific to a Disclosure group. This phase will have narrower efficiency bandwidths and more specific Disclosure Groups compared to Phase 1.

2.4 Phase 3: Modelled Disclosure

Phase 3 acts as an entry point into the disclosure scheme for buildings with no useful benchmarking energy consumption data, such as new buildings and existing buildings with poor metering data. This phase will allow buildings within a Disclosure Group to be assessed for their energy efficiency using computer modelling. A virtual model will allow for specific functions that affect energy use within buildings to be separately assessed in an existing building and allow normalisation based on climatic variations.

New buildings that enter the scheme via Phase 3 would progress to Phase 1 or Phase 2 once they have been occupied for a period of time and there is sufficient energy consumption data available.

3.0 Detailed Explanation of Phase Processes

The top four steps in Figure B2 show the processes involved in the preparation of the disclosure scheme. The Preparation Phase will establish the scheme for each of the

Disclosure Groups. Following the Preparation Phase, each Disclosure Group will progress individually through the other processes in this flow chart.

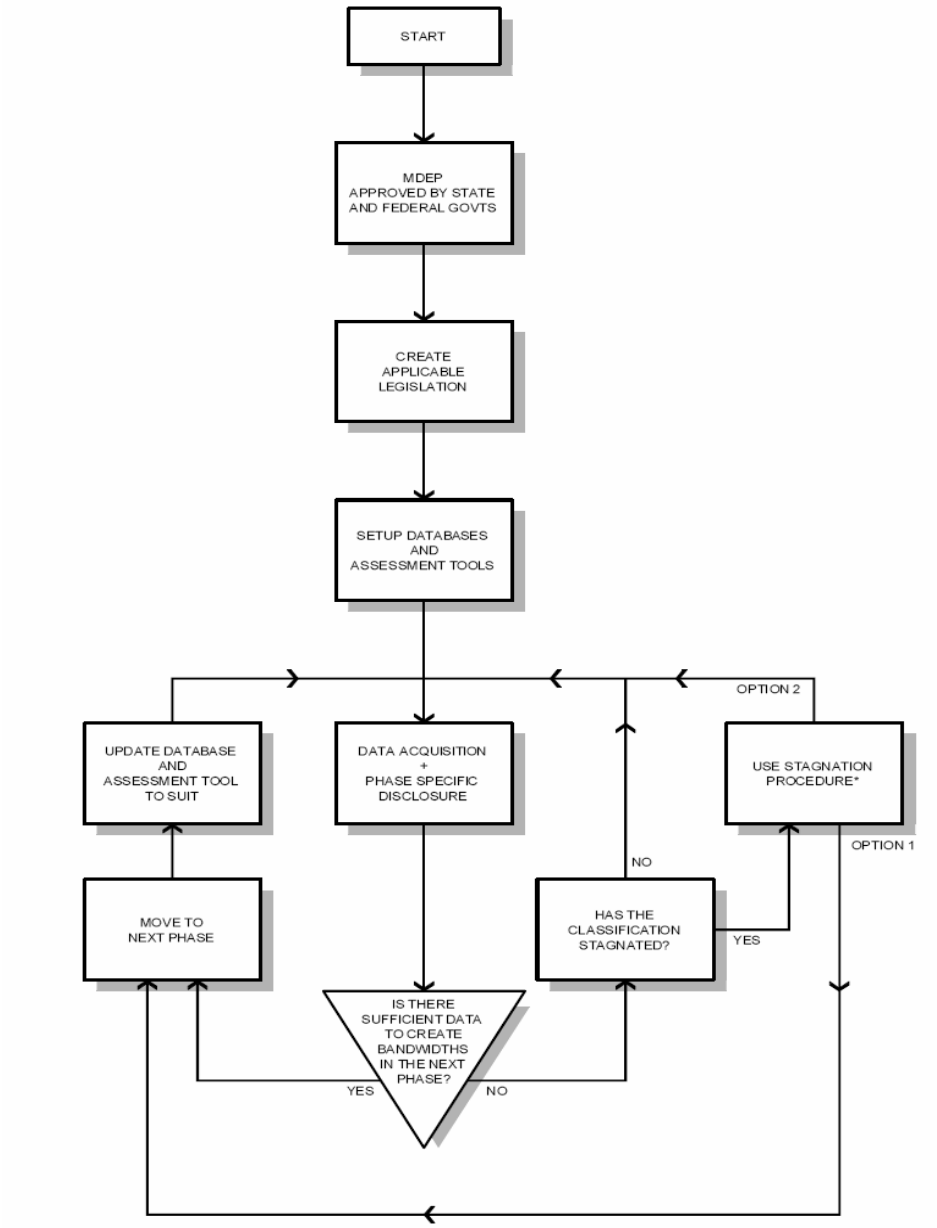

Figure B2 Common Phase Processes
* Refer to 3.6

Following the Preparation Phase, each phase of the scheme will contain similar processes. The difference between each phase is due to the increased depth of the energy data collection, assessment procedures and management methods.

3.1 Preparation Phase

Figure B3 represents the process involved in the Preparation Phase which contains unique processes that are not required in the other phases. The legislative framework for disclosure to be administered in each Australian jurisdiction is established during this phase. The databases, assessment and data submission protocols should be created and tested in this phase. After this is completed, the Preparation Phase will progress to the collection of energy consumption data from those responsible for paying the energy bills in each Disclosure

Group. This will lead to the creation of a 'map' of the energy use landscape of commercial buildings.

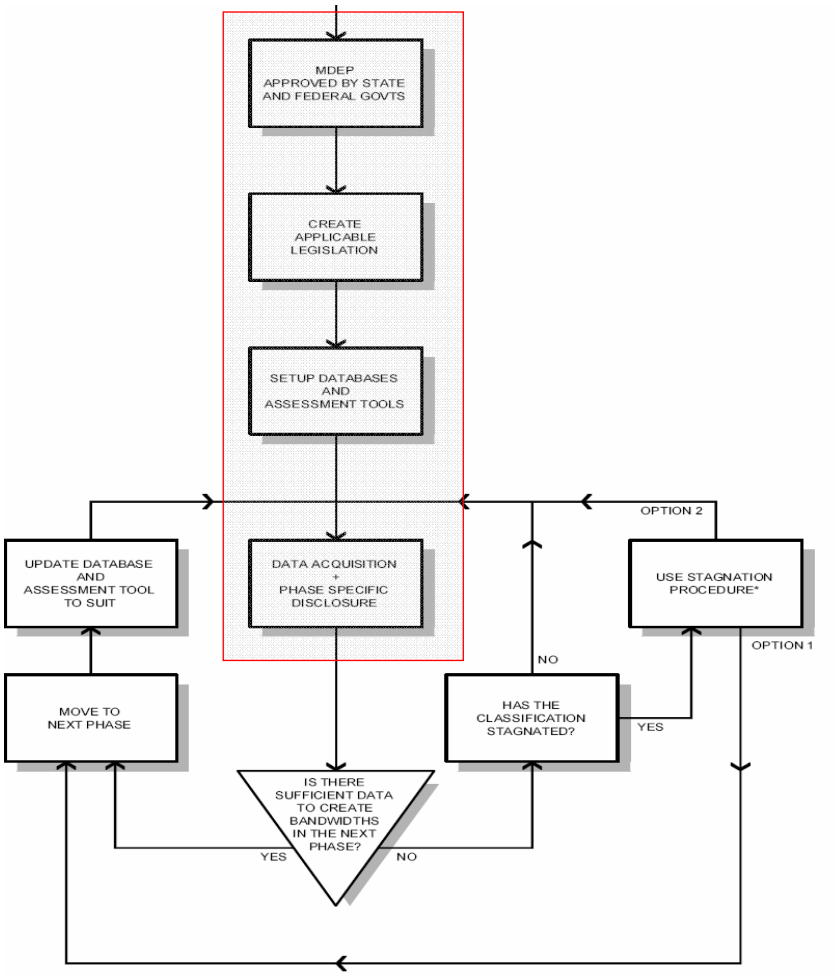

Figure B3 Steps involved in the Preparation Phase

3.1.1 Data Acquisition and Disclosure

During the Preparation Phase and Phase 1, energy consumption data is sourced directly from supply authority meters and submitted to the administrative body via such mediums as a website, fax or mail. To effectively use the simple data from supply authority meters, the choice and accuracy of normalisation data is essential. The hours of operation are also important so like industries can be compared.

Phases 2 and 3 require energy consumption data that provides a breakdown of energy usage (e.g. lighting, lifts, air-conditioning etc). Advances in energy metering technology allow many buildings to distinguish between energy usage in air-conditioning, lighting and small appliances.

For existing buildings modelled under Phase 3, all relevant energy consumption data should be used to verify the modelled results. The modelling can also be used to find viable improvements to the energy efficiency of existing buildings and the new and existing buildings modelling under Phase 3 can be carried out with established software tools.

It would be beneficial to educate building owners, clients and building managers on the processes for ensuring the quality of data during the Preparation Phase. An audit process should also be used for data validation.

3.2 Process of Progression between Phases

Figure B4 outlines the processes involved in progressing between phases. Each Disclosure Group will function as a discrete element in the scheme and once a Disclosure Group has accumulated sufficient data to progress, it will move to the next phase.

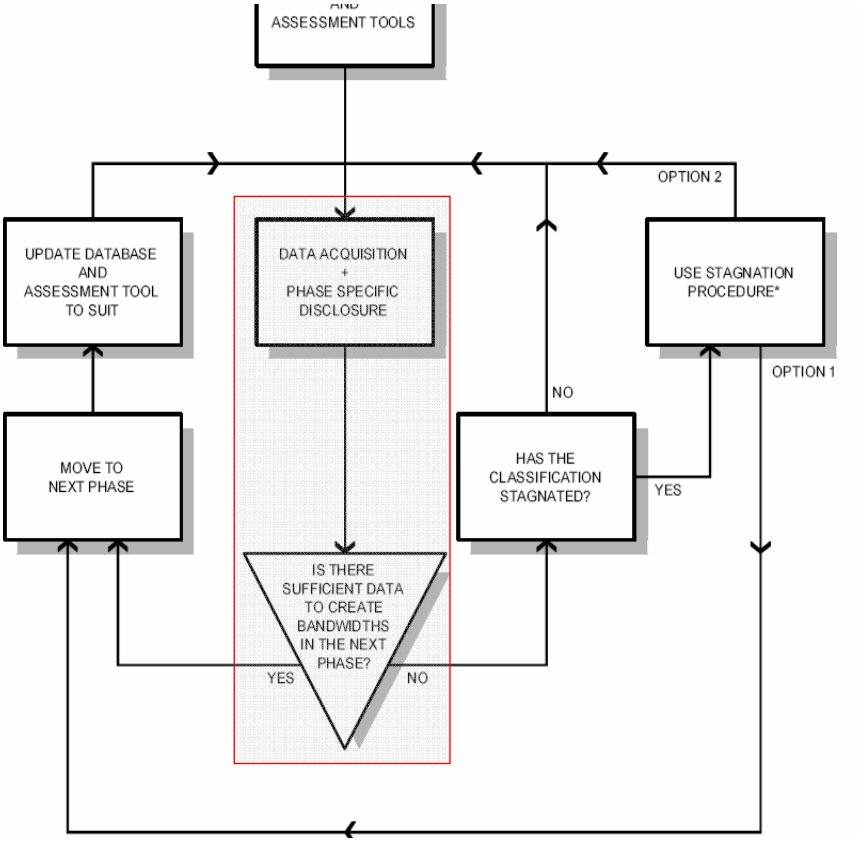

Fig B4 Progression between Phases

3.2.1 Updating Databases and Assessment Tools

Checking for update requirements is a function that is also outlined in Figure B4.

Databases need to be developed in each State and Territory. A web-based data submission system should ideally be developed as the user interface to achieve the required level of functionality.

The submission interface should be updated to suit the next phase before any Disclosure Group can advance. The tools used to assess new and existing buildings should also be updated periodically by the administrative body. New building assessments will advance towards greater accuracy as verification improves practices and new software becomes available on the market.

3.2.2 Progression Requirements

The stakeholders that exist within a progressing Disclosure Group are notified of the benefits and requirements of the next phase. The data required for the next phase may be more complex than was previously required.

3.3 Phase 1: Simple Disclosure (Whole Building)

Existing buildings can enter Phase 1 as soon as sufficient data has been collected for their Disclosure Group in the Preparation Phase. It is likely that most Disclosure Groups will progress into Phase 1 relatively quickly and new buildings in the design process would not enter this Phase.

3.3.1 Progression Requirements

For each Disclosure Group to progress into Phase 1, the administrative body must be able to rate the performance of a building against other buildings within the same Disclosure Group. The levels of energy efficiency in a Disclosure Group can be determined using one of three methods. These methods are listed below in order of cost-effectiveness:

- Statistical spread using gathered energy consumption data.
- A computer model of a generic building.
- An audit of building components using a standard procedure.

If there is insufficient energy data to create rating bands, a generic computer model and normalisation can be used to create the rating bands. This meets the functional requirements of the scheme because the energy efficiency would still be based on a 'like-with-like' basis.

3.4 Phase 2: Detailed Disclosure (Whole building, base building and tenancy)

Most Disclosure Groups will progress to Phase 2 and remain there. This phase allows for energy usage differentiation for whole buildings, base buildings and tenancies. The data from sub-metered circuits, typically sourced from Building Management Systems, will be entered into a more detailed database. This will allow a breakdown of energy use in each Disclosure Group and enable the comparison of energy use to a statistical spread. For example, an adequately metered building can provide a breakdown of energy use by energy type. In doing so, this phase will provide sufficient detail to target specific areas of inefficiency within buildings.

Appendix E contains an example certificate from the EU's EPLabel scheme. A similar certificate would be issued under Phase 2 of this scheme.

3.4.1 Progression Requirements

A Disclosure Group will require adequate sub-metering across the majority of the Disclosure Group to progress to Phase 2. Disclosure Groups that do not have the metering available to distinguish sources of energy usage may never progress past Phase 2. In some cases, it may be feasible to retrofit an older building with more extensive metering during routine maintenance in order to unlock further energy saving opportunities.

3.5 Phase 3: Modelled Disclosure

Disclosure Groups with existing building stock that are uncommon in design or function, need to enter Phase 3 in order to provide meaningful information to the market. Phase 3 is particularly useful for Disclosure Groups that are large energy users with limited industry counterparts but which will still yield economic benefits from improvements in energy efficiency. It is also applicable if the cost of assessing and improving the energy efficiency of the building is insignificant compared to the revenue to the owner.

Under Phase 3, computer modelling will allow for specific functions that affect energy use to be separately assessed in an existing building. Phase 3 would also be the entry point for new buildings. Once a new building had been operational for a period of time it would revert to a Phase 2 approach.

New buildings will display a different rating to existing buildings which will highlight the effects of occupant behaviour and usage patterns on the modelled energy efficiency. After a certain period of time, new buildings will become existing buildings and join Phase 1 or Phase 2 as appropriate for the Disclosure Group.

It is likely that the energy efficiency of simulated buildings will be different to the operational rating. Hence, it is recommended that both the simulated and operational rating be disclosed.

3.6 Stagnation and Exclusion

If a Disclosure Group has not progressed beyond the Preparation Phase or Phase 1 within a lengthy period of time it enters a state of stagnation. Figure B5 outlines the processes involved with stagnation. The administrative body may choose one of the following actions for a stagnated Disclosure Group:

- Create energy efficiency bands with computer modelling (as per Phase 3).
- Create an independent assessment protocol.
- Exclude the Disclosure Group from the disclosure scheme.
- Allow the Disclosure Group to remain stagnant.

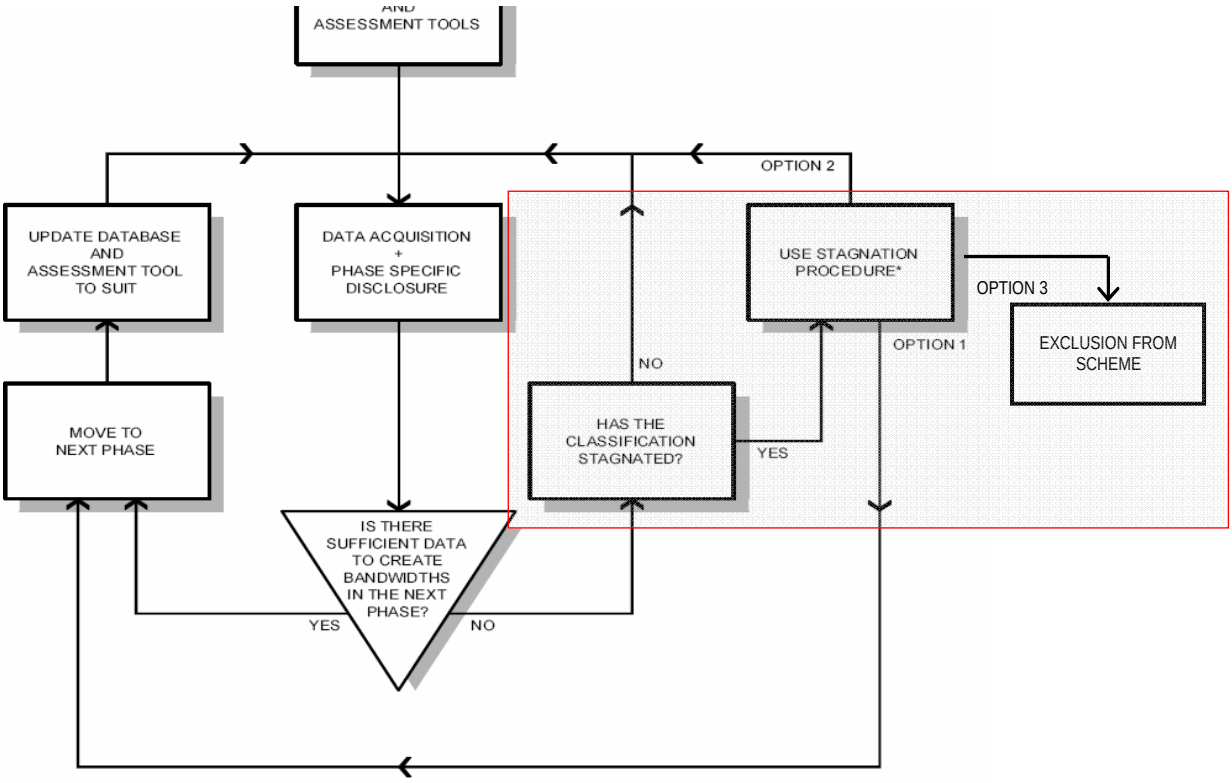

Figure B5 Stagnation Procedure

A Disclosure Group will enter into the stagnation status if there is insufficient data to proceed to the next phase. This is likely to depend upon the amount of time, in years, that a disclosure group has remained in the Preparation Phase or Phase 1 of the scheme. When a Disclosure Group achieves this period of time, and the administrative body decides it has stagnated, the stagnation procedure will commence.

As a general principle, it is envisaged that Disclosure Groups will rarely be considered stagnant. Disclosure Groups will be advanced to the next phase using the most cost-effective option available. In the instance where a Disclosure Group is isolated or unique, it may be more cost-effective to undertake an audit of individual buildings rather than create a modelled solution that has limited use for other buildings.

3.6.1 Exclusion

If it becomes apparent that a stagnated Disclosure Group has insignificant opportunity for energy efficiency improvements and/or negligible energy use, then the Disclosure Group may be excluded from the disclosure scheme. This will be at the discretion of the administrative body.

APPENDIX C - DATA COLLECTION AND PROCESSING (BASSETT APPLIED RESEARCH)

Fundamental to data collection is the availability of metering of different energy uses within new and existing buildings. The ability to breakdown energy consumption by equipment, tenancy, base building or other uses will lead to more effective disclosure. This issue will affect the accuracy and consistency of the energy efficiency disclosed.

New Buildings

New buildings have access to many opportunities to achieve a high level of energy efficiency. These include: more efficient technologies, better design practices, extensive metering, energy efficiency codes and standards. Most new buildings have extensive metering which allows the breakdown of energy consumption by usage and area within buildings. This means the available energy data will generally be more accurate and comprehensive in new buildings.

Existing Buildings

New and recently constructed buildings generally have more detailed energy efficiency data than older existing buildings due to the increased amount of metering. Adequately metered existing buildings are able to disclose energy consumption data that is useful but not as detailed as data from new buildings. Older buildings will typically not be able to separate energy use in any more detail other than the annual total energy consumption.

Benchmarking

Setting benchmarks from energy data using statistical measures for poor, average and exceptional levels of energy efficiency is a key element for the ongoing development of the disclosure scheme. The more useful data is accumulated, the more accurate energy efficiency grading and benchmarks can be developed and used. This will have a direct correlation to the credibility of the disclosure measure.

Efficiency Bandwidths

A simple star rating (or an A to E grading) will enable the market to readily compare the performance of two similar buildings. The bandwidths for these ratings will be set in each Disclosure Group to rank a building against the statistical spread of data. This will separate performers into grades ranging from poor to average to good performers. These bandwidths need to be updated over time as the energy efficiency of the building stock within a Disclosure Group changes.

Metering

In the context of a disclosure scheme, metering is essentially a means to gather energy consumption data. The data gathered from metering is required in any scheme both to create a statistical spread of performers and to rank buildings in a Disclosure Group within that spread.

The installation of detailed metering within commercial buildings needs to be advocated. Current metering arrangements range from some structures having only supply authority meters, as a means to measure cumulative energy use, to modern buildings having

sophisticated Building Management Systems to record a detailed breakdown of the areas of energy use, such as lighting, air-conditioning and/or individual manufacturing machines.

In some older buildings supply authority meters may be the only means to measure energy consumption. In some cases, such supply meters may cover multiple tenancies or areas of buildings. Buildings with adequate (or extensive) metering can take advantage of the ability to identify areas of inefficiency. Better metering infrastructure needs to be advocated in such older buildings for the success of the disclosure scheme.

APPENDIX D - PHASE DEPENDANT ELEMENTS (BASSETT APPLIED RESEARCH)

	Disclosure Metric	**Building Type**	**Assessment Method**	**Assessor Training**	**Building Audits**	**Auditor Training**	**System Review**	**Record Keeping**
Preparation Phase	Simple energy use unit. kWh/m^2 or kWh/person kWh/widget	Existing buildings. Whole Building.	Data submitted to website from the supply authority meter. Reference to website with class & region averages as they become available.	No formal qualifications required. Assessment methods detailed Market informed of consequences of non compliance.	Audits of a random selection of the building stock by approved private and government auditors.	2 day course to establish good audit practice and compliant assessment methods.	Biannual review to validate data, assessor and audit quality. Classes able to move to next phase assessed.	Owner to keep data for 3 disclosure periods.
	Data Collection	**Assessment Fees**	**Disclosure Group**	**Extent of Disclosure**	**Incentives**	**Compliance**	**Timing of Disclosure**	
	Annual energy use, Classification Normalising factors for climatic variations.	No fees for self assessment.	All non residential classes of buildings.	Make available to building occupants. Displayed on contracts for prospective tenants and buyers.	Provide rebate incentives for better quality data returned to the admin body.	Grace period for the first phase. Depending on the knowledge of the industry on the need to assess and submit data. The need to chase up X% of the building stock as a reminder rather than an audit.	Annual	

Phase 1	**Disclosure Metric**	**Building Type**	**Assessment Method**	**Assessor Training**	**Building Audits**	**Auditor Training**	**System Review**	**Record Keeping**
Simple Performance Disclosure	Performance disclosure of energy use based on performance bands and climatic variations. Stars or A-E grading.	New and existing buildings, Separate base building and tenancy disclosures to correspond to installed Supply Authority Meters.	Data submitted to admin body via website, post or fax. Bills and website updated with performance bands as they become available. A comparison of EE and star bands.	1 day course to establish compliant assessment method with a take home exam.	Audits of a random selection of the building stock by approved private and government auditors.	2 day course to establish good audit practice and compliant assessment and disclosure methods.	Annual review to validate data, assessor and audit quality. Classes able to move to next phase assessed.	Owner to keep data for 3 disclosure periods.
	Data Collection	**Assessment Fees**	**Disclosure Group**	**Extent of Disclosure**	**Incentives**	**Compliance**	**External Feedback**	**Timing of Disclosure**
	Annual energy use, Classification Normalising factors for climatic variations.	No fees for self assessment.	All non residential classes of buildings with functional performance bands.	Displayed in a public place in the building/tenancy. Displayed on contracts for prospective tenants and buyers.	Provide feedback to good performers. Offer certification if they want it. Publicise a rebate list or a printable checklist of EE opportunities for each class.	Penalties and/or mandatory audits apply to parties found not providing accurate information or failing to disclose to the relevant parties.	Assess the trends in the data to quantify the effect of MDEP.	Data submitted annually, 3 year certificate. Performance disclosure only updated if there is a significant change. Most up to date data used on sale or lease.

Phase 2	Disclosure Metric	Building Type	Assessment Method	Assessor Training	Building Audits	Auditor Training	System Review	Record Keeping
Corrected Performance Grading	Performance disclosure of energy use based on performance bands and climatic variations. Stars or A-E grading.	New and existing buildings, Separate base building and tenancy disclosures to correspond to installed Supply Authority Meters.	Data submitted to admin body via website. Bills and website updated with performance bands as they become available. A comparison of EE and star bands.	1 day course to establish compliant assessment method with a take home exam.	Audits of a random selection of the building stock by approved private and government auditors.	2 day course to establish good audit practice and compliant assessment and disclosure methods.	Annual review to validate data, assessor and audit quality. Classes able to move to next phase assessed.	Owner to keep data for 3 disclosure periods.
Timing of Disclosure	**Data Collection**	**Assessment Fees**	**Disclosure Group**	**Extent of Disclosure**	**Incentives**	**Compliance**	**External Feedback**	**External Stimulus**
Data submitted annually, 3 year certificate. Performance disclosure only updated if there is a significant change. Most up to date data used on sale or lease.	Annual energy use, Classification Normalising factors for climatic variations.	No fees for self assessment.	All non residential classes of buildings with functional performance bands.	Displayed in a public place in the building/tenancy. Displayed on contracts for prospective tenants and buyers.	Provide feedback to good performers. Offer certification if they want it. Publicise a rebate list or a printable checklist of EE opportunities for each class.	Penalties and/or mandatory audits apply to parties found not providing accurate information or failing to disclose to the relevant parties.	Assess the trends in the data to quantify the effect of MDEP. Also open a feedback path for 'As Designed' rating so the discrepancy starts to close.	Ensure energy efficiency consultants, property managers & design consultants are aware of new business opportunities that are about to exist in phase 3.

Phase 3	Disclosure Metric	Building Type	Assessment Method	Assessor Training	Building Audits	Auditor Training	System Review	Record Keeping
Customised Performance Grading	Performance disclosure of energy use based on individual models, performance bands and climatic variations. Stars or A-E grading.	New and existing buildings, Separate base building and tenancy disclosures to correspond to installed Supply Authority Meters.	Data submitted to admin body via website. Bills and website updated with performance bands as they become available. A comparison of EE and star bands.	1 day course to establish compliant assessment method with a take home exam.	Audits of a random selection of the building stock by approved private and government auditors.	2 day course to establish good audit practice and compliant assessment and disclosure methods.	Annual review to validate data, assessor and audit quality. Classes able to move to next phase assessed.	Owner to keep data for 3 disclosure periods.
	Data Collection	**Assessment Fees**	**Disclosure Group**	**Extent of Disclosure**	**Incentives**	**Compliance**	**Timing of Disclosure**	
	Annual energy use, Classification Normalising factors for climatic variations.	No fees for self assessment.	All non residential classes of buildings with functional performance bands.	Displayed in a public place in the building/tenancy. Displayed on contracts for prospective tenants and buyers.	Provide information to Disclosure Groups where there was previously none. Provide a list of energy saving opportunities for each class.	Penalties and/or mandatory audits apply to parties found not providing accurate information or failing to disclose to the relevant parties.	Data submitted annually, 5 year certificate. Performance disclosure only updated if there is a significant change. Most up to date data used on sale or lease.	

APPENDIX E - EXAMPLE ENERGY CERTIFICATE

Below is an example of the certificates issued under the EUs EPLabel scheme (refer to Figure E1). A similar level of detail is proposed for the certificates issued under Phase 2 of the mandatory disclosure scheme described in Appendices B and D.

The certificate provides separate ratings for 'As built' and 'In use' which represents the level of energy efficiency for a building when new and the time of operation. This information may be used to determine whether the building is at its optimal operational level of energy efficiency and whether opportunities may exist for improvement.

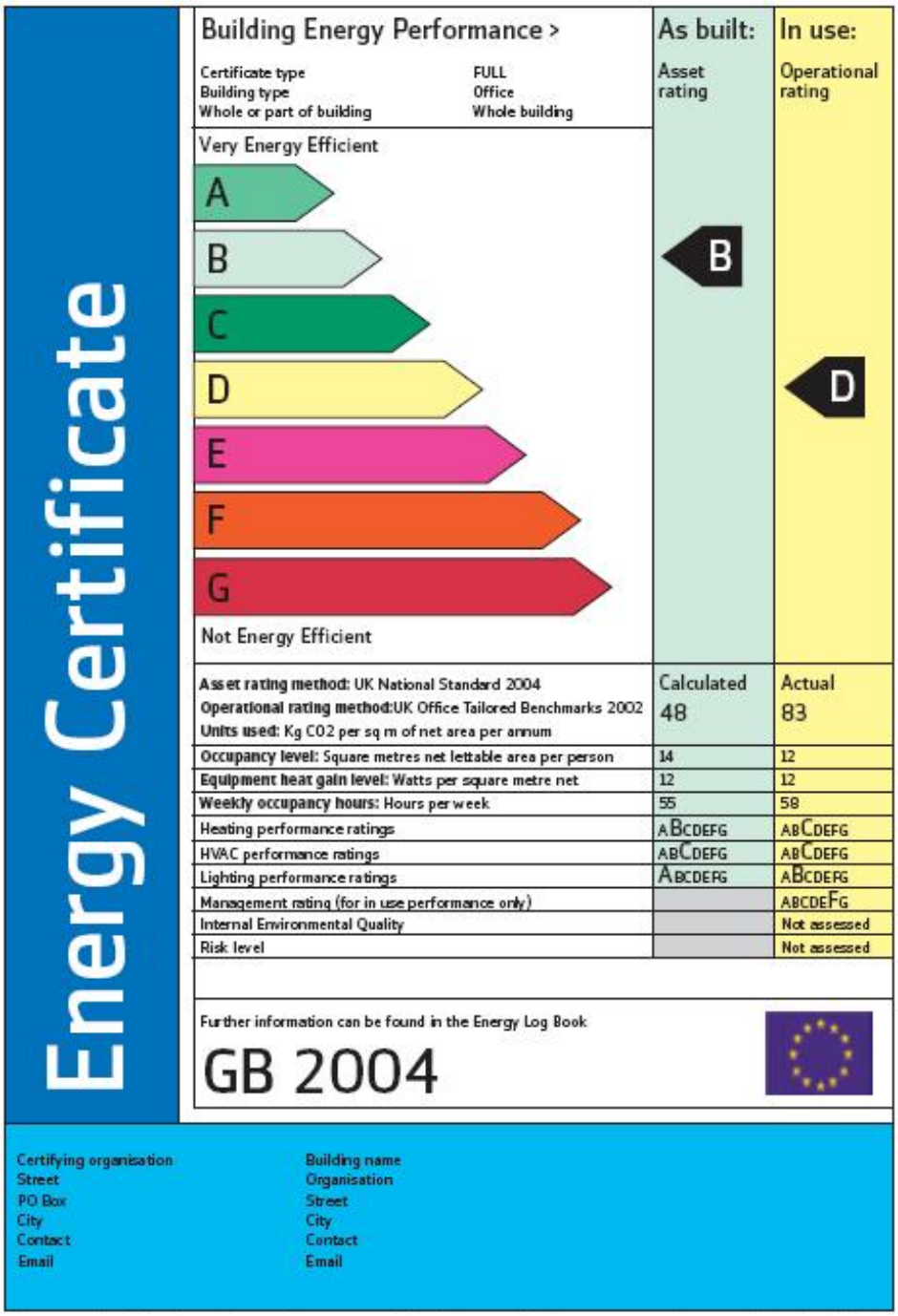

Figure E1 Example EPLabel Energy Certificate

APPENDIX F - CLIMATE ZONES

Australia has a diverse range of climates and its landmass includes climate zones described as temperate, desert, tropical and equatorial. As a result, buildings in different regions have different energy use requirements. For example, in the northern regions cooling and humidity requirements are more significant, whereas, in the southern regions heating and cooling requirements are more significant.

To account for these climatic differences in computer modelling, Australia has been divided into 69 regions of similar climate, that is, regions where local climate conditions are unlikely to require significant building design differences (refer to Figure F1). The number of climate zones is limited by the number of locations of appropriate quality climate data and locations which are sufficiently unique to warrant separation from nearby zones (AGO 2007).

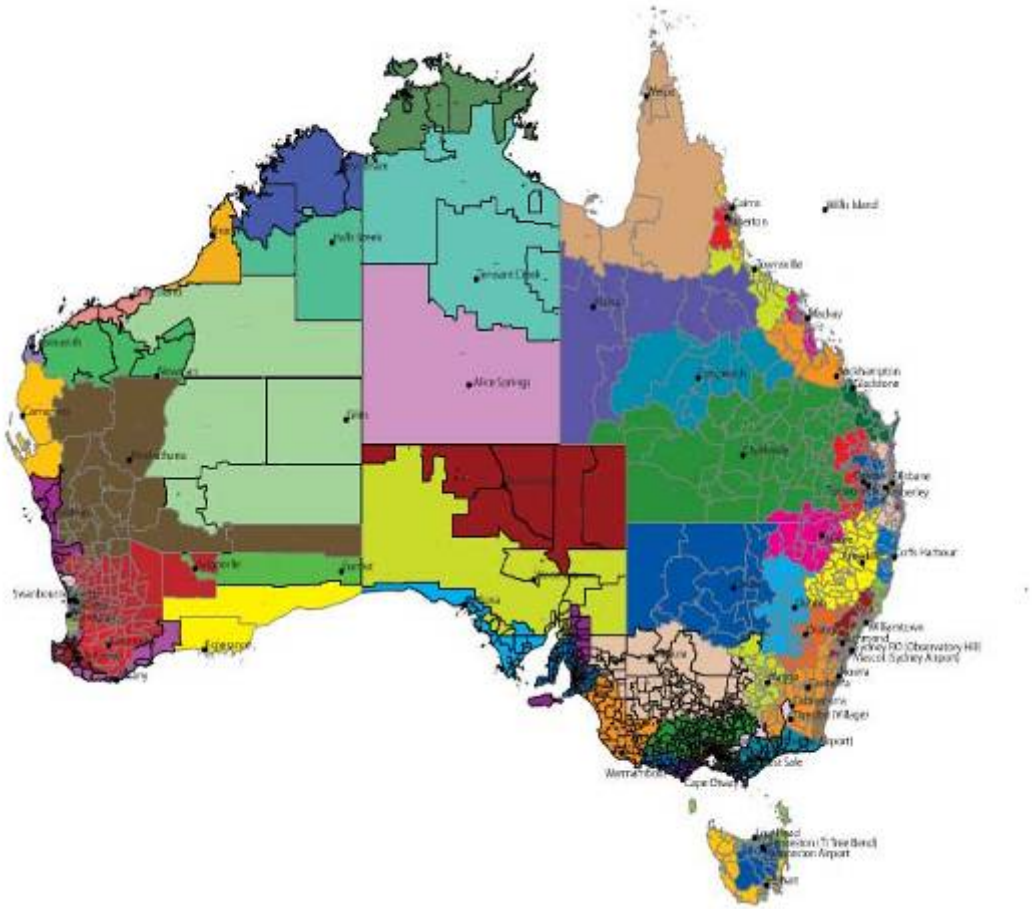

Figure F1 Climate zones for computer modelling

APPENDIX G - SUMMARY OF STAKEHOLDER COMMENT

Introduction and Background

The development of a national regime for the Mandatory Disclosure of Commercial Building Energy Efficiency was included in Stage One of the National Framework for Energy Efficiency (NFEE) commencing December 2004. The continuation of this work now forms part of Stage Two of NFEE.

A consultation draft of the Mandatory Disclosure of Commercial Building Energy Efficiency - Concept Report was released to stakeholders on 19 December 2007. The closing date for responses was 29 February 2008.

A total of four responses were received from both government and industry stakeholders. A number of other stakeholders indicated by email or telephone that they were not making a submission.

This report has been prepared in response to the four sets of comments received on the consultation draft.

Comments from stakeholders

1. General

Most respondents accepted that there was some value in a mandatory disclosure scheme for commercial buildings. One respondent expressed strong objection to the whole proposal.

2. Market Failure

There was specific discussion of the effect of market failure to building energy efficiency and what might be the impact of intervention. The specific economic issues raised under this heading require further in-depth analysis that ought to occur at the next phase which is to develop a Regulatory Impact Statement.

3. ABGR and Green Star ratings

There was a strong view from industry respondents that the ABGR scheme in its current form would be inappropriate for mandatory disclosure. Most importantly, however, the comments indicated a desire for a more comprehensive, consistent and holistic national rating scheme—regardless of whether it was ABGR, Green Star or any other.

Any scheme should:

- Be designed or improved to operate as a nation-wide mandatory framework, not a voluntary framework.
- Have a transparent and independent governance process to ensure that concerns with the tool are properly considered and addressed.
- Be extendable to other types of commercial buildings, such as hospitals and schools.
- Identify energy efficiency opportunities.
- Ensure consistency/standardisation between office building ratings state to state and building to building so that a truly national standard would be in place.

- Examine the potential for the design performance verses the actual performance, or use both methods as the standard for rating buildings.
- Learn from all the other tools available in the market to continuously improve the rating tool.
- Have the tool available on a voluntary basis outside of mandatory requirements.
- Be simple to understand and use.
- Provide information that is valuable to the owners, managers and occupants of the building by improving their efficiency

It was also questioned whether the rating should go beyond energy efficiency, such as the inclusion of water and waste stream efficiency.

There was support for the Green Star ratings system as well but it too would still require changes before implementation.

ABGR, Green Star and any other rating schemes need to be further assessed to ensure that a scheme is in place that can meet current demands and develop alongside the requirements of a national mandatory scheme.

4. How significant is the proportion of building emissions relative to other sources

It was suggested that the scheme should focus upon other types of commercial buildings, such as hospitals and schools. These could potentially be included in future schemes or as part of an amendment to this scheme. However, the focus is currently office buildings because they produce the most greenhouse gas emissions for the sector and have the most standard features of any of the other commercial building types. They are also transacted more often, whereas, schools and hospitals rarely change hands through leasing or selling. Furthermore, office buildings are experiencing the highest growth (new and retro fit) within the commercial building sector.

5. Evidence for mandatory disclosure reducing greenhouse gases

Like other foreign schemes for energy efficiency product disclosure, Mandatory Disclosure of Commercial Building Energy Efficiency is not intended to deliver direct abatement of greenhouse gas emissions. Rather, disclosure schemes are intended to facilitate abatement by providing information to empower the marketplace. For this reason, and because disclosure schemes always occur with other incentive and information schemes, it is difficult to quantify the effect of mandatory disclosure on the reduction of greenhouse gases. The benefits of mandatory disclosure can be more apparent when examined in conjunction with policies or market mechanisms intended to lead to direct abatement. These issues will be examined in more detail through the Regulatory Impact Statement processes.

6. Compliance cost/red tape

New programs inevitably create some compliance expenditure. However, the assumption that the rating tool (whichever it might be) can be applied at a relatively low cost and the process kept relatively simple, leaves the relative costs minimal compared to other programs. Again, this issue will be examined in more detail through the Regulatory Impact Statement processes.

7. Success of mandatory disclosure overseas

The UK example, in particular, was raised by respondents. The UK scheme is certainly well advanced although not fully implemented. It is particularly important to note that the UK, and the EU, view mandatory disclosure as key to any modern energy efficiency/greenhouse gas abatement strategy.

The UK scheme was briefly examined in the Consultation Report, however, it is acknowledged that further analysis of the UK scheme would be beneficial.

8. Does it fit into other policy frameworks, particularly emissions trading / Will it detract from other initiatives.

Yes, it will fit into other frameworks because it is providing information on energy efficiency and that information will be valuable to any emissions trading scheme or other rebate programs.

As with the overseas models, mandatory disclosure should be designed to complement other programs—not detract from them. As previously mentioned, a national mandatory disclosure regime should be designed to facilitate abatement and complement schemes that lead to direct abatement.

9. Privacy issues

There may be privacy issues about energy consumption for tenants (under an actual performance scheme) and this will require further analysis as to what information is required in the rating system and to what extent any private information could be extracted.

10. Current practices of energy-use disclosure

It was suggested that since property owners already disclose various degrees of energy use to prospective purchasers and lessees on the energy use of base buildings, there is no value in mandating a disclosure regime.

This issue will be examined further as part of the Regulation Impact Statement processes which needs to consider the business-as-usual scenario.

GLOSSARY

ABARE	Australian Bureau of Agriculture and Resource Economics
ABCB	Australian Building Codes Board
ABGR	Australian Building Greenhouse Rating Scheme
ABS	Australian Bureau of Statistics
ABSA	Association of Building Sustainability Assessors
BAU	Business-as-usual
BCA	Building Code of Australia
BMC	Building Management Committee
BMS	Building Management System
COAG	Council of Australian Governments
DEC	Display Energy Certificate
DEWHA	Department of the Environment, Water, Heritage and the Arts
EEGO	Energy Efficiency in Government Operations
EPC	Energy Performance Certificate
ETS	Emissions trading scheme
EU	European Union
GBCA	Green Building Council of Australia
GLS	Green Lease Schedule
HVAC	Heating, ventilation and air-conditioning
NFEE	National Framework for Energy Efficiency
MCE	Ministerial Council on Energy
SDS	Sustainable Design Scorecard
UK	United Kingdom

REFERENCES

ABCB – see Australian Building Codes Board

AGO – see Australian Greenhouse Office (now DEWHA)

AIRAH – see Australian Institute of Refrigeration, Air Conditioning and Heating

CIE – see Centre for International Economics

GBCA – see Green Building Council of Australia

IEA – see International Energy Agency

IPCC – see Intergovernmental Panel on Climate Change

NFEE – see National Framework for Energy Efficiency

WBCSD – see World Business Council for Sustainable Development

Australian Building Codes Board (2006a) *ABCB Protocol for building energy analysis software for class 3, 5, 6, 7, 8 and 9 buildings*, version 2006.1, Australian Building Codes Board, Canberra

——— (2006b) *Regulation impact statement (RIS 2006-02): proposal to amend the Building Code of Australia to include energy efficiency requirements for class 5 to 9 buildings*, Australian Building Codes Board, Canberra

——— (2007) *Building Code of Australia: Class 2 to 9 Buildings*, Volume One, CanPrint Communications, Canberra

Australian Building Greenhouse Rating (2002) *Performance ratings: guidelines for collecting data*, NSW Department of Environment and Climate Change, Sydney, viewed 17 September 2007, <www.abgr.com.au/downloads/guidelines.pdf>

Australian Greenhouse Office (1999a) *Baseline study of greenhouse gas emissions from the commercial buildings sector with projections to year 2010*, report prepared by EMET Consultants & Solarch Group, Canberra

——— (1999b) A*ustralian commercial building sector – greenhouse gas emissions 1990-2010*, Commonwealth of Australia, Canberra

——— (2002) *Background - scope for action to reduce greenhouse emissions for commercial and industrial buildings*, viewed 12 December 2007, <www.greenhouse.gov.au/local/reduction/building/background>

——— (2005) *A study into international directions for the mandatory disclosure of the energy performance of buildings*, report prepared by FaberMaunsell, Australian Greenhouse Office, Canberra

——— (2006a) *Energy efficiency in government operations (EEGO) policy*, Australian Greenhouse Office, Canberra

——— (2006b) *Scoping study to investigate measures for improving the environmental sustainability of building materials*, report prepared by the Centre for Design - RMIT University, Australian Greenhouse Office, Canberra

——— (2006c) *Tracking to the Kyoto target 2006: Australia's greenhouse emissions trends – 1990 to 2008-12 and 2020*, Commonwealth of Australia, Canberra

——— (2007) *Climate zones*, viewed 28 November 2007, <www.nathers.gov.au/about/climate-zones>

Australian Institute of Refrigeration, Air Conditioning and Heating (2000) *AIRAH handbook: millennium edition*, AIRAH, Melbourne

Bassett Applied Research (2007) *Mandatory disclosure of the energy performance of commercial buildings: issues paper*, Milton QLD

British Columbia Hydro (2007) viewed 10 October 2007, <www.bchydro.com/business>

Building Commission Victoria (2006) *Energy analysis software tools*, Melbourne, viewed 17 September 2007, <www.buildingcommission.com.au/www/html/1338-energy-analysis-software-tools.asp>

Carbon Trust (2007) viewed in 9 October 2007, <www.carbontrust.co.uk/energy>

Centre for International Economics (2007) *Capitalising on the building sector's potential to lessen the costs of a broad based GHG emissions cut*, Canberra

City of Port Phillip and Moreland City Council (V3.2), *Guide to using the sustainable design scorecard non-residential*, Melbourne, viewed 1 December 2007, <www.morelandsteps.com.au/pdf/Sd%20Scorecard%20Non-residential%20Guide%20V3.2.pdf>

Department for Communities and Local Government, England (2007) viewed 29 November 2007, <www.communities.gov.uk/planningandbuilding/theenvironment/energyperformance/certificates>

Department for Environment Food and Rural Affairs, England (2003) viewed 9 October 2007, <www.defra.gov.uk/environment/energy/internat/ecbuildings>

Department of Energy and Environment, Denmark (2007) viewed 15 November 2007, <www.en.sbi.dk/research/energy_and_environment>

Department of Industry Tourism and Resources (2004) Ministerial Council on Energy, viewed 27 September 2007, <www.mce.gov.au>

DTZ Research (2007) *Global office occupancy costs survey 2007*

Energy Task Force (2004) *Securing Australia's energy future*, Department of the Prime Minister and Cabinet, Canberra

Green Building Council of Australia (2007) *Green Star: an Environmental Rating System for Buildings*, viewed 1 December 2007, <www.gbcaus.org/gbca.asp?sectionid=88&docid=952>

Howard, NP, Cole, RJ, Sharp, DP, Davies, TE & Bengtsson, J (2007) 'A study into the suitability of sustainability tools as part of a national implementation model', BRANZ (unpublished)

International Energy Agency (2007) *Mind the gap – quantifying principal-agent problems in energy efficiency*

Intergovernmental Panel on Climate Change (2007) *Working group III: summary for policymakers*

Investa (2006) *Green lease guide for commercial office tenants*, Investa Property Group, Sydney

Jaffe, AB & Stavins RN (1994)'The energy-efficiency gap – What does it mean?', *Energy Policy* 22:804-810

Manitoba Hydro (2005) *Power smart savings, rebates & loans*, viewed 10 October 2007, <www.hydro.mb.ca/savings_rebates_loans.shtml#business>

McCartney, D (2007) *The business context of sustainable commercial buildings*, Your Building, viewed 12 December 2007, <www.yourbuilding.org/display/yb/The+business+context+of+sustainable+commercial+buildings>

Ministry of Economy, Trade and Industry, Japan (2006) *Energy efficiency and conservation policy in Japan*, viewed on 19 November 2007, <www.nedo.go.jp/kokusai/kouhou/181206/session02/2-1.pdf>

Murtishaw, S & Sathaye, J (2006) *Quantifying the effect of the principal-agent problem on US residential energy use, Lawrence Berkeley National Laboratory*, Paper LBNL 59773

National Emissions Trading Taskforce (2006) *Possible design for a national greenhouse gas emissions trading scheme (discussion paper)*

National Framework for Energy Efficiency (2004) *NFEE stage one: implementation plans (as approved by MCE – December 2004)*, Canberra

National Framework for Energy Efficiency (2007) National Framework for Energy Efficiency, viewed 27 September 2007, <www.nfee.gov.au>

Office of Energy Efficiency, Natural Resources Canada (2007) viewed 9 October 2007, <www.oee.rncan.gc.ca/english>

Point Carbon (2007) 'New Research by Point Carbon: CO_2 Price Trend to Rise', Press Release, 14 September 2007

Productivity Commission (2005) *The private cost effectiveness of improving energy efficiency*, Report No.36, Commonwealth of Australia, Canberra

The Australian Financial Review (2007) 'Green ideals out of energy', The Australian Financial Review, 8 December 2007

U.S. Department of Energy (2007) *Tax deductions for commercial buildings*, viewed 9 October 2007, <www.eere.energy.gov/buildings/info/documents/pdfs/bt_comm_tax_credit.pdf>

Wilkenfeld G & Assoc & Energy Strategies (2003) *Australia's greenhouse gas inventory 1990, 1995, 1999, end use allocation of emissions*, Australian Greenhouse Office, Canberra

World Business Council for Sustainable Development (2007) *Energy Efficiency in Buildings – Business Realities and Opportunities*, WBCSD, Geneva