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WE SPEAK FOR  
AIR CONDITIONING

Energy White Paper Taskforce  
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Dear Sir/Madam

## ENERGY WHITE PAPER

Thank you for the opportunity to provide a submission regarding the *Issues Paper to inform preparation of a White Paper*.

The Air Conditioning and Mechanical Contractors' Association (AMCA) is the national peak trade association for member companies operating in the commercial and industrial air conditioning and mechanical services industry. Our members are highly skilled commercial operators with expertise in the design, manufacture and installation of air conditioning and specialised ventilation systems, as well as the ongoing service and maintenance of plant, equipment and infrastructure.

### Submission summary

Improved energy efficiency has the ability to significantly reduce peak demand, thereby reducing the need for investment in network capacity and delivering a reduction in consumer prices and cost pressures. Consequently, the AMCA encourages the Energy White Paper to support the broader regulatory framework instituted to improve Australia's built environment energy efficiency as a key pillar of the review.

### Industry profile

The contribution of the refrigeration and air conditioning industry to the national economy is exemplified by the 20,000 businesses that contribute 1.7% of GDP and employ 173,000 people across Australia.

The importance of the sector is further emphasised by the fact that HVAC systems account for approximately 50% of a building's energy consumption. Indeed, in buildings with older or less efficient systems, HVAC can account for upwards of 75% of total energy usage.

Table 1 **Size and shape of the refrigeration and air conditioning industry**

173,000 people employed	\$5.9 billion expenditure on new equipment (2012)
20,000 businesses in operation	\$533 million spent on refrigerant gas
\$13.3 billion in wages per annum	\$26.2 billion in total expenditure per annum
1.7% of GDP	Air conditioning to 140 million square metres of non-residential buildings

Source **Cold Hard Facts 2 (2013)**

## Summary of Issues

### Regulatory reform and the role of Government

The built environment has correctly been identified as a significant consumer of energy, with much effort being invested by government, businesses and households to improve energy efficiency.

Regulatory initiatives and schemes include:

- National Strategy on Energy Efficiency
- Heating, Ventilation Air Conditioning High Energy Efficiency Strategy (HVAC HESS)
- Minimum Energy Performance Standards (MEPS)
- Greenhouse and Energy Minimum Standards (GEMS)
- Energy Efficiency provisions in the National Construction Code
- National Australian Built Environment Rating System (NABERS)
- Green Building Council of Australia (GBCA)
- Commercial building disclosure

Such efforts have successfully produced a decline in energy consumption since 2009; however energy prices have continued to rise over the same period (Grattan Institute, 2013, Shock to the system: dealing with falling electricity demand).

Consequently, the AMCA advocates that any review of energy markets should contain as a key objective the aim of supporting existing regulatory frameworks to improve the energy efficiency of the built environment. With respect to the review of tariff structures, reform should be consistent with the aim to incentivise investment by businesses and households in new technologies.

Furthermore, while much regulatory attention has been focused on encouraging investment in more energy efficient energy systems, it is important to note that energy consumption of the built environment is largely dependent on quality service and maintenance of property, capital equipment (plant) and building services (air conditioning, climate control, fire services etc.). The AMCA encourages the White Paper to consider potential regulatory responses to ensure the optimisation of energy efficiency throughout the asset lifecycle.

### Workforce productivity

Workforce skills that enhance energy efficient outcomes in the built environment are still in their infancy and largely remain secondary considerations to more entrenched skills within professional and trade qualifications.

Opportunities exist for government and industry to elevate the practice of energy efficiency, both within individual corporate cultures, but more importantly within the broader training and educational framework for building and construction, building services installation, commissioning, facilities management, and service and maintenance professions.

Furthermore, it is important to note that a highly skilled workforce not only improves the capacity of individuals, but helps in the education of consumers to adopt new energy efficient practices and technologies.

Following the introduction of the National Strategy on Energy Efficiency, the mechanical contracting industry has begun to embed units of competency into trade apprenticeships and has introduced post-trade qualifications and training aimed at producing improved sustainability and energy efficient outcomes.

For example, the AMCA has developed a unit of competency, *Energy Efficiency for HVAC Systems*, which aims to develop a diverse range of skills, which includes:

- communicating the importance of energy efficient outcomes to clients and other stakeholders
- identifying opportunities to induce more energy efficient outcomes
- identifying energy efficient solutions in the design, installation, commissioning and maintenance of HVAC systems.

Such units are an important first step, but could be augmented by the strengthening of working relationships between government, TAFE and industry to facilitate the development of high quality training and education capable of being delivered in formats that suits the needs of business (for example, on-site training and on-the-job learning).

The development of ongoing working relationships between key stakeholders would facilitate the continual improvement of training and educational outcomes as energy efficiency becomes better understood, but also to identify key skill gaps not previously foreseen.

## Driving energy productivity

### National Construction Code (NCC)

'As designed' energy performance alone is not sufficient to ensure the actual energy efficiency of a building. Instead, an integrated framework is required to align the NCC with other aspects of building practices that impact the overall energy efficiency of a building, including:

- rating tools
- company accreditation for retrofitting
- minimum energy performance standards (MEPS) for equipment
- specialised areas of best practices such as commissioning, tuning, service and maintenance.

*Deemed to Satisfy* (DTS) provisions is an important component of the NCC, particularly for small commercial building projects where the application of ratings tools is not a viable option. DTS also acts as a default industry standard, thereby providing an important floor to energy performance standards; however, a more rigorous approach to ensuring compliance with DTS provisions is required to achieve energy efficient outcomes.

Allowances for *Alternative Solutions* provide incentives for innovative design that can lead to more energy efficient outcomes and performance. However, without clear energy performance guidelines and benchmarks, alternative solutions can also be used purely as a workaround to cumbersome DTS provisions, thereby undermining the energy performance requirements.

Consequently, greater compliance with the NCC, and therefore more energy efficient outcomes, would benefit from more transparent energy performance requirements that draw upon benchmarking from comparable buildings.

### Rating tools

The National Australian Built Environment Rating System (NABERS) and Green Building Council of Australia (GBCA) are valuable ratings processes that have achieved broad industry adoption.

NABERS forms a good overall understanding of performance and provides a useful means of setting standards. It is characterised by a mature process with proven infrastructure and assessors whom are skilled in the management and operation of buildings.

Similarly, GBCA provides a range of ratings tools that provides a significant amount of coverage of the energy rating components of different building types, including office, education, healthcare, industrial and others.

However, greater integration, transparency and convergence of the technical components and modelling protocols underpinning each rating tool would enhance industries ability to design, install and operate more energy efficient solutions. It is pleasing to note that the NABERS algorithm has recently been released, providing industry with more insight into how the building and construction sector can achieve more energy efficient outcomes in line with NABERS requirements.

There remains significant scope for human error; however, greater integration and transparency would help to reduce the need for judgements that could compromise rating outcomes.

Given that HVAC systems account for approximately 50% of a building's energy, rising to upwards of 75% in older buildings, it is important that a ratings tool specifically for HVAC systems be developed and integrated into broader ratings tools such as NABERS and GBCA.

This has been identified as a priority under the Commonwealth's HVAC High Efficiency Systems Strategy. Specifically, the *Calculating Cool* online diagnostic tool is proposed to deliver a better understanding of the actual energy performance of the HVAC system, and should be incorporated into the broader ratings tools to provide a better overview of the building's overall energy efficiency.

Importantly, this diagnostic tool will not be limited to encouraging best practice HVAC system design, but will recognise the importance of meticulous commissioning, tuning and regular service and maintenance throughout the life-cycle of the building.

### **Planning design certification**

Current building inspection and certification processes administered in each state jurisdiction are not adequate to ensure compliance with energy efficiency provisions. The regulatory system relies heavily upon self-certification and does not sufficiently encourage or support independent assessments, particularly for small commercial developments. Furthermore, the complexity inherent within Section J of the NCC means that regulators often do not have the technical expertise to conduct thorough assessments.

Such challenges are exacerbated by State and jurisdictional variations, which can undermine the national approach to energy efficiency by increasing the complexity and ambiguity of energy efficiency provisions, thereby inhibiting greater compliance and acting as a disincentive to implement best practice.

Building surveyors, certifiers and building regulators need to take a more proactive role to ensure that energy efficiency is embedded within the approval process. For example, the staged process for mandatory notification for inspection currently does not adequately capture the inspection of HVAC systems.

There could also be a role for the independent assessment and certification of large commercial buildings in a similar way to which we have independent commissioning agents. These independent officers should be engaged throughout the building process to ensure that the design, installation and equipment meets the design intent prior to the building be finalised and the HVAC components covered over.

### **Commissioning, Service and Maintenance**

Energy efficient designs can be undermined by poor equipment selection, a lack of tuning and skilled commissioning, and inadequate service and maintenance throughout the building lifecycle.

Consequently, any initiative aimed at improving the actual energy efficiency of a building must go beyond the building design to capture aspects of building operations and maintenance.

Commissioning must be accepted as a “whole of system” process through verifying and documenting all facility systems performance in accordance with the design documentation and intent, and with the owner’s operational needs, including the preparation of operation personnel.

Generally, three broad processes constitute commissioning:

- setting up and testing systems to ensure they meet design intent
- recording system settings and operating attributes and providing documentation for future reference
- providing a comprehensive handover brief and training for maintainers and operators.

In addition to the handover brief, an important consideration must be made to post-occupancy evaluation. This can be one year after the end of the warranty period and also take into consideration annual testing and evaluation to ensure that the systems still operate in accordance with the design intent and the performance levels.

Furthermore, installation and commissioning should be done according to established technical standards by entities that have the necessary qualifications such as those recognised by the Australian chapters of the National Environmental Balancing Bureau (NEBB).

## **Further Consultation**

The AMCA would welcome the opportunity to consult further with the Department of Industry.

Should you wish to discuss any of the issues raised in this submission further, please contact AMCA Policy Analyst, Ben Hawkins, in the first instance on (03) 8831 2810 or by email on: [benhawkins@amca.com.au](mailto:benhawkins@amca.com.au).

Yours Sincerely



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