



Energy Strategies

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A Sketch of the Economic Significance of Climate Control services in the Commercial Sector in Australia

Prepared by
Energy Strategies

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INTRODUCTION

The Climate Control industry is loosely defined as those people and businesses that design, construct, install and maintain heating, ventilation and air-conditioning systems in non-residential buildings.

To date this has not been an industry that has been defined in its own right and has largely been hidden, aggregated into data collections on other sectors, primarily the construction industry. As a result data is very limited and the most conservative projections and multipliers have been used. As such there is 95% confidence that the figures herein are significant underestimates and should be regarded as something of an economic 'sketch' of the industry. However we believe they provide a starting point from which various industry participants can begin to fill in many of the obvious gaps in data. Updates of this short report will be issued periodically as new data is provided or discovered.

EMISSIONS (from energy consumption)¹

Based on 33% of energy used in commercial buildings² being consumed by HVAC systems (upper range estimates are up to 60%) then by 2010 emissions produced by energy used in HVAC systems will be 22Mt per annum or 3.75% of projected national emissions in that year.

ENERGY

Again using the above estimate for the proportion of energy consumed in commercial buildings required by HVAC systems then approximately 63PJ of electricity per annum (being ~8% of all electricity consumed in Australia and responsible for 91% of the emissions from HVAC energy consumption) and 30 PJ of natural gas (being responsible for 9% of emissions from HVAC energy consumption).

SCALE

CSIRO estimates that there are between 180 million and 200 million m² of all types of non-residential buildings in Australia. The Property Council of Australia now tracks more than 20 million m² of commercial office space. For the purpose of this estimate we are assuming that at least 60% of the upper estimate of this space has some climate control services. Therefore there is at least 140 million m² of buildings in Australia serviced by some form of electrical and/or gas heating, ventilation or air-conditioning system.

¹ Estimates of direct emissions of refrigerant gases are not included. Data on imports of refrigerant gases has not been made available but will be available in the next few weeks.

² Estimates of energy used in the commercial sector based on ABARE Fuel and Electricity Survey data and Pupilli 2004 for SEAV.

EMPLOYMENT

The Australian Refrigeration Council has reported that more than 15,000 individuals licences have been issued for experienced personnel and trainees working on stationary air-conditioning and refrigeration. They also report as many as 20,000 businesses operating in this sector. For the purpose of this strategy we are estimated that there are at least 5 other people employed in the industry for every person with a refrigeration licence. Thus at least 90,000 employees.

BALANCE OF TRADE

Based on available Customs and ABS datasets

2002 – 2003 Net imports \$387 million (\$460m imports, \$73m exports).

2004 – 2005 Net imports \$442 million – increase in value of ~ 8% in real terms

About half by value of total imports come from Thailand and about a quarter from Japan. The balance come from a number of different countries, but imports from China have been growing rapidly in the last two or three years. These figures include only commodities that are explicitly categorised as air conditioning equipment. They exclude imports of other system components, e.g. control equipment, which are used in HVAC systems, but also in many other types of systems and installations. It also excludes the value of imports of refrigerant gases.

MANUFACTURING

2002 – 2003 Industrial air conditioning units \$181 million

2002 – 2003 Selected materials and components (includes products which may be used in non-HVAC applications)³ ~ \$593 million

These figures exclude a variety of other system components and parts, such as control system components and cabling, which are common to both air conditioning equipment and a variety of other types of equipment and installations.

EXPENDITURE ON NEW SYSTEMS

Based on 2002-03 figures, adding net imports⁴ to value of manufacturing⁵

Net Imports 02/03	~ \$428 million
Manufacture 02/03	~ \$656 million
Total	~\$1,084 million
Installed cost x 2.2	~ \$2,385 million
Inflate x 4% pa to 2006	~ \$2,683 million

³ Sheet metal ducting, non-electric iron or steel radiators for central heating; air heaters and hot air distributors incorporating a motor driven fan or blower, compressors for refrigerating and air conditioning equipment.

⁴ Net imports calculated by adding a further 10% for system components such as control equipment not classified as air conditioning equipment.

⁵ Manufacturing calculated by discounting selected materials and components by 30% for those goods not used in HVAC systems, adding industrial air conditioning units, and adding a further 10% of resulting value for other materials and consumables in construction and installation.

EXPENDITURE ON MAINTENANCE AND SERVICES

No reliable estimate of the value of maintenance services is available. As an interim measure, for the purpose of this estimate, we are assuming that an amount equivalent to the estimated annual investment in new systems is being spent annually on maintenance of the entire installed base of systems, while this is almost certainly a considerable underestimate of the value of this part of the industry it is a safe starting point. Thus estimate of maintenance and services ~ \$2.68 billion.

ESTIMATED DIRECT SPENDING ON COMMERCIAL HVAC SYSTEMS 2006

Energy Spend	~ \$2.20 Billion
New Systems	~ \$2.68 Billion
Maintenance	~ \$2.68 Billion

Total ~ **\$7.56 Billion**

An alternative way of seeking to estimate the spend by the industry is via employment. Wage and salary costs are a major part of the installation mark-up factor of 2.2 and also of the estimated total value of maintenance, and therefore should be included in the above total. However, it is also known that there are approximately 15,000 holders of refrigerant licenses who work on stationary systems. Assuming that the industry employs a further 4 persons for each license holder, and that average wages in the industry equal average annual earning (\$51,637 in 2006), then the total value of wages and salaries is \$4.65 billion. If this figure is correct, then the total value of the industry would likely be closer to \$10 billion than the \$7.5 billion shown above. This is around 1.2% of Australia's GDP.

These estimates of direct spending on the construction, installation, operation and maintenance of HVAC services in non-residential buildings will continue to be refined as more data becomes available.

BROADER CONTRIBUTION TO ECONOMIC ACTIVITY AND SOCIETY

Incalculable, HVAC services are an essential service contributing directly to the comfort, wellbeing and productivity of the workforce, the maintenance of essential computing and telecommunications infrastructure and the preservation and storage of valuable goods.

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