



Carbon Disclosure Project 4

(CDP4) Response



May 2006





Foreword



As one of Australia's leading diversified property groups with a market capitalisation of more than \$AUS3 billion the Mirvac Group considers itself a leader in corporate social responsibility and specifically its focus on addressing risks and opportunities related to social, economic and environmental sustainability.

Climate change and its potential for impact on key business undertakings including property development, tourism and asset management is an important element of ongoing and future risk and opportunity planning across all Mirvac divisions.

As a first time participant to the Carbon Disclosure Project (CDP) at the invitation of The Investor Group on Climate Change Australia/New Zealand Mirvac Group strongly supports the project and its objectives. Participation in the CDP is an important indicator to institutional investors that climate-related risks are considered as part of organizational risk and opportunity planning.

Mirvac acknowledges climate change as a financial risk and more importantly an overall risk to future generations. Whilst the financial risks of managing climate change may not ultimately impose a direct bottom line cost, Mirvac Group considers the ability to quantify and understand those aspects of its business, which produce Greenhouse Gas Emissions, as a competitive advantage in terms of cost and market risk management. As a CDP participant Mirvac Group is better positioned to achieve cost-effective risk management solutions and adapt to unforeseen future climatic or other environment related developments.

I look forward to participation in future carbon disclosure projects and commend institutional investors on the establishment of this farsighted project.

Greg Paramor
Managing Director, Mirvac Group



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1. Introduction

The Mirvac Group (Mircvac), a leading diversified property group, is committed to industry leadership in sustainable development.

Listed on the Australian Stock Exchange with a market capitalisation of more than \$AUS 3 billion, the Mirvac Group is active in investment, development, and hotel and funds management.

Within the Investment division, Mirvac owns and manages more than 60 investment grade properties valued at more than \$AUS 2.9 billion. The portfolio includes commercial offices, retail centres, industrial properties, hotels and car parks across Australia, leased to quality tenants including leading Australian and international companies.

The Group's Development division is active in New South Wales, Victoria, Queensland and Western Australia, and is responsible for some of Australia's premium residential property development including Newington – Australia's first solar suburb, Sanctuary Gardens, Newbury Estate and Walsh Bay in New South Wales; Arbour on Grey and Cutters Landing in Queensland; Yarra's Edge, The Heath and The Melburnian in Victoria and Burswood in Western Australia. Mirvac currently holds approximately 18,700 lots that will be progressively developed over the next 8-10 years.

Mircvac Hotels has approximately 3,000 rooms under management in Australia and New Zealand, operated predominantly under the Quay West, Quay Grand, Sebel and Citigate Sebel banners, making it one of the largest Australian-owned hotel groups.

Mircvac's Funds Management division manages approximately \$AUS 2.5 billion on behalf of more than 35,000 institutional, superannuation and private client investors. The investment vehicles include listed and unlisted trusts, property debt funds and listed and unlisted infrastructure funds, some including assets with sustainable attributes.

1.1 Mirvac and Sustainability

At Mirvac sustainability is a journey, not a destination, and means adopting business principles and practices that meet the needs of stakeholders without compromising future resource availability.

Mircvac is engaged in a journey which involves long term commitment to the integration of sustainable principles and practices which endeavour to balance stakeholder expectations with economic outcomes. Decision making processes aim to effectively integrate both long and short-term economic, environmental, social and equity considerations to promote sustainable outcomes across Mirvac for the benefit of its Stakeholders and the broader community.

This is the first year that Mirvac has been invited to respond to the Carbon Disclosure Project, with the institutional investors group now including companies listed on the Australian Stock Exchange (ASX) 100 within its focus. The preparation of the response by Mirvac has provided a valuable opportunity to examine current positioning on business activities associated with the generation of Greenhouse Gases (GHG) along with risks and potential opportunities to Mirvac's business structure and function from climate change.

Participation in the CDP has also brought to focus the extent to which Mirvac currently tracks and reports on GHG emissions across the Group's organizational structure. Whilst robust data is available from some Divisions, others, such as the James Fielding Funds Management Division, only recently acquired, do not come from a strong empirical data position with respect to determining GHG across its asset portfolio. However, the journey continues and the Mirvac Group is now on a pathway to continued and improved GHG data collation and interpretation.



2 Questionnaire Response

2.1 General

How does climate change represent commercial risks and/or opportunities for your company?

The Mirvac Group is committed to industry leadership in sustainable development through innovative design and construction of residential and non-residential buildings and improvement in the overall efficiency of its existing property investment and management portfolio assets including Hotels. The Australian and New Zealand Sustainable Investments Funds extend Mirvac's commitment to sustainability into its Funds Management Division.

Mirvac management seeks to integrate climate change considerations in core planning operations of the Mirvac Group, and to extend these operations in response to opportunities presented by climate change and the regulatory developments associated with it.

At the same time, Mirvac is aware of the brand value and risk reduction retained by corporate proactive positioning in relation to sustainability issues. As such, an ability to demonstrate that Mirvac is committed to addressing the challenge of climate change contributes to the retention and augmentation of intangible as well as tangible value.

Recent research released by the Australian Business Roundtable on Climate Change¹ confirms that Australia is particularly vulnerable to climate change. Companies are already incurring impacts in financial terms due to the effects of climate change on their costs, revenues, assets or liabilities².

With high property exposure, Mirvac is particularly conscious of the impacts of climate change on the built environment, including energy use and availability, the scarcity of water resources, and the impact of more extreme weather events. Climate proofing properties will become part of the acquisition and management process. Increased management costs as a flow-on from higher energy demand, from heating and cooling costs have been forecast. However, opportunities arising from increased demand for energy efficient commercial and residential properties are increasingly emerging as a focus for Mirvac.

Within the Hotels Division and its high exposure to the tourism industry, there exist further climate change impact risks such as deterioration of environmental quality relating to natural assets such as coral reefs, tropical and temperate forests, water regimes and biodiversity fragmentation. Preferred tourism locations may differ, due to changing humidity, temperature, rainfall and extreme weather and its variability.

Within the Funds Management Division, exposure exists in a wide range of areas, including increased demand for disclosure of risk management, direct and secondary impact on infrastructure assets. The Australian and New Zealand Sustainable Investments Fund (ASIF & NZIF) and the James Fielding Infrastructure Sustainable Equity Fund (SEF), with a focus on forest products are potentially at risk from changed weather patterns, however provide new opportunities relating to the environmental services associated with Land Use Land Use Change Forestry (LULUCF) project development.

¹ Australian Business Roundtable on Climate Change, April 2006, The Business Case for Early Action

² A climate for change: A trustee's guide to understanding and addressing climate risk Australian and New Zealand Investor Group on Climate Change (IGCC)



2.2 Regulation

What are the financial and strategic impacts on your company of existing regulation of GHG emissions, and what do you estimate to be the impact of proposed future regulation?

The operations of Mirvac's development division is currently exposed to a number of State based mandatory greenhouse gas emissions programs for its residential dwellings. These include the Sustainable Building Index (BASIX) in New South Wales; 5 Star for residential development in Victoria; and the Standard Building Regulations in Queensland. All programs specify mandatory energy efficiencies and some also include water efficiencies. Mirvac's development division continues to work closely with each state government in the development and refinement of these initiatives and its designs adequately meet or in some cases exceed the mandatory requirements specified for each state based scheme.

The operations of Mirvac's Investment and Hotel Divisions are currently exposed to one mandatory greenhouse emissions program only – the New South Wales (NSW) Greenhouse Gas Abatement Program. Mirvac does not hold any obligation under this trading scheme as electricity retailers manage the emission reduction obligation but the scheme does present opportunities for built assets in NSW. As such, Mirvac has generated New South Wales Greenhouse Abatement Certificates (NGACs) under this scheme through building efficiency improvements, and includes a consideration of this additional financial revenue in its sustainability improvement processes for its assets.

Mirvac anticipates that further regulation relating to GHG emissions is likely to create increased opportunity in the jurisdictions in which Mirvac is active, and may also imply risks associated with higher electricity costs, inter alia. Mirvac accepts this as a fact of the current and future operating environment, and responds by ensuring that a focus on best-practice design and asset management is continuously maintained under its sustainability initiatives to maximise opportunities and minimise risk.

Already, Mirvac has exposure in international carbon markets through investment in Kyoto-compatible forestry assets. It is expected that this early experience in carbon markets will afford learning opportunities to expand such activities, and contribute materially to investment profitability.

2.3 Physical risks

How are your operations affected by extreme weather events, changes in weather patterns, rising temperatures, sea level rise and other related phenomena both now and in the future? What actions are you taking to adapt to these risks, and what are the associated financial implications?

Mirvac is aware of the need to address the physical risk associated with climate change and climate variability. While no detailed modelling incorporating specific climate change scenarios has been undertaken in relation to building design, Mirvac does model its larger developments for wind and storm events based on historical data.



In addition, change in weather patterns including scarcity of water across Australia has resulted in innovation in water efficiency and harvesting and also energy efficiency across the development, Investment and Hotel Divisions.

Mirvac is aware of the long-term potential impacts of climate change to asset value. Mirvac expects that, in the medium term, issues such as facility ecology, and planning restrictions relating to climate change, will be the issues of most pertinence to the company. In addition, Mirvac understands that there may be more indirect impacts of climate change, including changes in insurance and other service availability and cost. The Mirvac strategy of resource use minimisation in the design and operation processes should assist in the reduction of exposure to such future risks.

In addition, Mirvac understands that climate change may affect growth regimes of its forestry assets.

2.4 Responsibility

Who at board level has specific responsibility for climate change related issues and who manages your company's climate change strategies? How do you communicate the risks and opportunities from GHG emissions and climate change in your annual report and other communications channels?

Mirvac has established a detailed chain of responsibility for the development and management of sustainability strategies across the organisation which includes GHG management and climate change strategies.

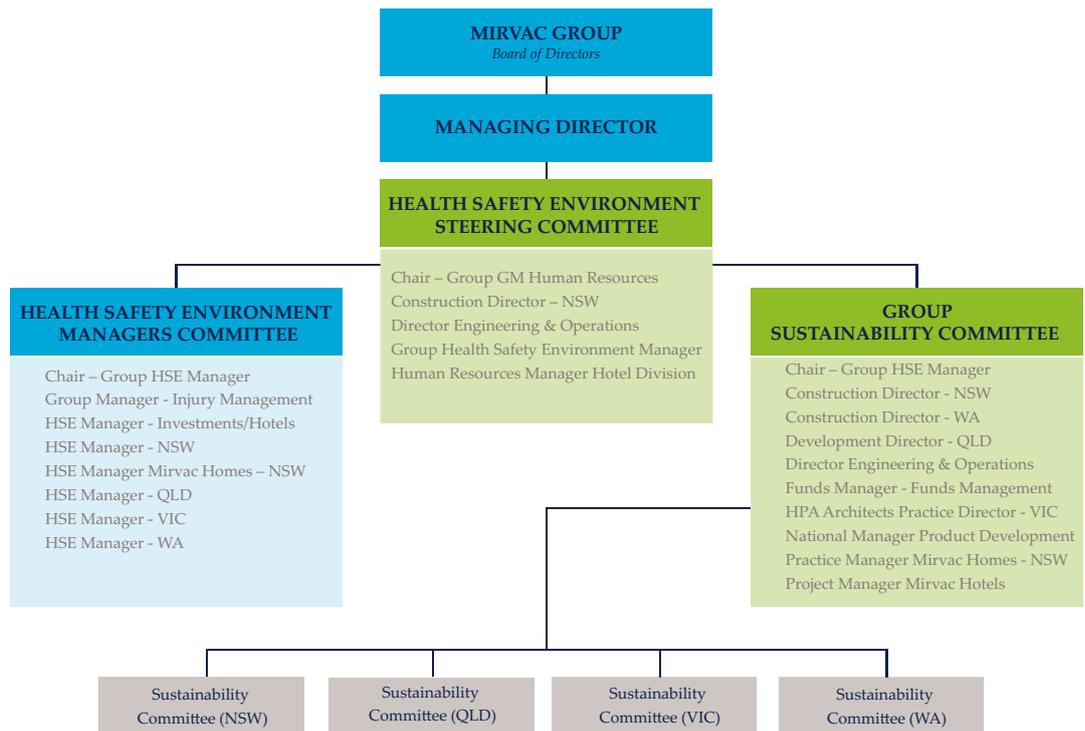


Figure 1: Mirvac Sustainability Reporting Structure



At Mirvac the Group Sustainability Committee (GSC) determines overall strategy for sustainability across all Mirvac divisions supported by the activities of Sustainability Committees in each State or region of operation. The GSC reports to the Health Safety Environment Steering Committee which advises the Managing Director and Board of Directors on sustainability practices, innovation, strategy, and performance targets and achievements.

The Group Sustainability Committee is responsible for:

- Managing the implementation of the objectives and goals outlined in the Mirvac Sustainability Policy against the business objectives of the Group and the interests of its Stakeholders.
- Fostering innovation and the integration of eco-efficiency principles across each Mirvac Division and the Group overall.
- Monitoring performance against sustainability objectives and targets and deriving benchmarks to drive improved outcomes.
- Integrating a national program of sustainability initiatives across the Group in key resource areas including: facility ecology, energy, water and waste.
- Fostering partnerships with government and industry champions to drive innovation and practical solutions.
- Education and awareness amongst employees and stakeholders.
- Monitoring corporate social responsibility standards across the Group.
- Advising the Health Safety Environment Steering Committee on sustainability practices, innovation, strategy and performance against targets.

2.5 Innovation

What technologies, products, processes or services has your company developed, or is developing, in response to climate change?

Mirvac is committed to industry leadership in sustainable development. Innovation and engagement with stakeholders, including customers, clients, government and industry bodies has been at the forefront of the Mirvac sustainability journey. Initiatives focused on achieving reductions in GHG emissions are detailed below.

Newington was developed in conjunction with Lend Lease as an innovative example of how sustainability can be incorporated into mainstream residential developments within Australia and has become a worldwide benchmark in this regard.

Newington – The Sydney 2000 Olympic Games Village

Sustainable innovations incorporated into Newington include:

- All houses built for the Sydney 2000 Olympic Games incorporated 1kw rooftop solar photovoltaic panels generating electricity to match energy demand. The panels were connected back to the grid and Newington was the world's largest solar village at the time of the 2000



Games. All houses built since the Games also have photovoltaic panels incorporated as standard.

- All houses incorporate gas boosted solar hot water systems.
- All houses are designed to maximise solar access and cross ventilation potential and incorporate other passive energy efficiency measures such as increased insulation.
- All materials are selected through lifecycle costing analysis to minimise their impact on the environment.
- All stormwater is reticulated to water quality ponds and reused for irrigating adjacent parklands.
- Sewage is mined as part of the Sydney Olympic Park water treatment system and reticulated back into Newington for garden watering and vehicle washing.

Newington is also internationally recognised for its innovative urban design and the contribution that this makes to place making and community enhancement.

Australian Building Greenhouse Rating System (ABGR) - Partnership with Department of Energy, Utilities and Sustainability (DEUS)

Mirvac has been a partner with the Department of Energy, Utilities and Sustainability (DEUS), formerly Sustainable Energy Development Association (SEDA), since November 1998 and commenced a five year action plan to implement energy efficient projects and improve operational practices in its portfolio of investment properties.

In recognition of involvement with the Australian Building Greenhouse Rating (ABGR) System, Mirvac was awarded Gold Compliant status for Stage 1 of its program in 2002, Stage 2 of its program reached Silver Compliant status in November 2004 and Gold was achieved in 2005.

To year end, 2005, Mirvac has made CO₂ savings in excess of 14,681 tonnes, energy savings of more than 14,094 MWh and gas savings of 8250GJ. This represents annual cost savings of \$686, 656 which is a 54% return on completed projects. These initiatives have been, and continue to be, initiated across the Mirvac Group investment portfolio nationally.

Mirvac has several existing commercial properties rated under the Australian Building Greenhouse Rating (ABGR) and these properties have been rated at 3 stars or better. In 2002 The Optus Tower in North Sydney (101 Miller Street) was evaluated as 3 stars which at the time was "Current Market Best Practice." The property was re-evaluated earlier in 2005 and has been officially re-rated as 4 stars ABGR which is a significant improvement, given the size and age of the asset and testimony to Mirvac's commitment to continuous improvement and ongoing evaluation of existing assets.

As part of Mirvac's initiatives nationally, all commercial assets will undertake an ABGR in 2006 to assist in evaluation and improvement of existing assets into the future.

Energy Monitoring Program

Mirvac has recently introduced a software package to aid in its management of buildings – the Energy Monitoring Program. The program simplifies management and reconciliation of energy



purchases, enabling building managers to maintain a focus on energy use, the key to improving energy efficiency and environmental outcomes.

The information provided by the software enables Mirvac to accurately monitor each asset's consumption of energy and allows the Group to quickly evaluate the cost implications of process change without waiting for monthly energy bills. It provides the ability to monitor benchmarking capabilities, historical data analysis, demand load management capabilities, greenhouse emission analysis and reporting functionality.

Mirvac And Tenants Environmental Sustainability (MATES) Program

Mirvac has partnered with Energy Conservations Systems (ECS) to establish the Mirvac And Tenants Environmental Sustainability (MATES) Program. Through the MATES program, tenants of Mirvac assets are able to engage ECS to undertake a detailed energy (and water if applicable) assessment of each tenancy to determine the current total energy performance and efficiency strategies. Services in the program include:

- a fully costed turn key solution to reduce energy bills and greenhouse gases;
- detailed description of each sustainability improvement;
- guaranteed energy savings;
- annual reduction in tonnes of CO₂;
- Australian Building Greenhouse Rating (ABGR); and
- recommendations for in-house sustainability improvements.

ECS is also able to guide Mirvac tenants (MATES) through the implementation process.

Tenant Energy Management Handbook

Developing an energy efficient building is of little value if the users of the building are not educated in how to reduce energy consumption. Mirvac has recognised this key issue in respect of its environmental outcomes and in conjunction with the NSW Sustainable Energy Development Authority, developed a Tenant Energy Management Handbook which is distributed to all Mirvac commercial tenants. The handbook shows tenants how to work "energy smart", introduce energy efficient technology and provides tools for measuring performance and other energy management initiatives.

3CBDs Greenhouse Initiative

In 2005 Mirvac became a partner in the 3CBDs Greenhouse Initiative for its tenanted space, in conjunction with the Sydney, North Sydney and Parramatta City Councils. The initiative formalises and recognises many of the practices and activities already being completed by Mirvac in benchmarking and measuring its own performance as a tenant in its own buildings.

On-going Contribution to the Development of Building Rating Schemes

Mirvac is a foundation member of the Green Building Council of Australia (GBCA) and a Platinum Sponsor of the Green Building Council's Green Star Shopping Centre Rating Tool.



Mirvac's sponsorship is providing the financial resources for the current development of the tool, which will be the only one of its kind for retail developments in Australia.

Pre-empting the requirements of the shopping centre rating tool, Mirvac is developing Orion Greater Springfield as a world leading, best practice, sustainable retail project. Located in the western corridor of Brisbane, Queensland (QLD), Orion Greater Springfield will be a 194,000m² greenfield town centre development in the master planned Springfield community. The project is currently in the construction phase and preliminary design details indicate that the centre will use about half the energy required of a typical shopping centre of the same area and through water harvesting innovation a 62% reduction in potable water use will be achieved. An Agreement is currently being negotiated with the QLD Environmental Protection Authority (EPA) to define a working partnership relating to the sustainability initiatives and performance at the Orion project.

Mirvac is also involved in the piloting of the National Australian Built Environment Rating System (NABERS) program for commercial buildings and is committed to assisting DEUS in the development of an ABGR tool for the retail sector.

Furthermore, Mirvac has collaborated with the NSW Department of Infrastructure, Planning and Natural Resources to fine tune the multi residential dwelling Sustainable Building Index (BASIX). Pioneering the testing of the rating tool, Mirvac piloted the tool on a recent Mirvac development project at Chatswood, Sydney to evaluate its practical implications and cost effectiveness.

Sustainable Investment Products

Mirvac, through its funds management division - offers two new innovative sustainability funds: Australian and New Zealand Sustainable Investments Fund (ASIF & NZIF) and the James Fielding Infrastructure Sustainable Equity Fund (SEF).

The development of these funds has been prompted by demand for investment products in the area of forestry and related environmental services, and the desire to bring together investors that share a common view towards environmental sustainability and ethical investment. A key component of the ASIF business model is the selection of investments based on the land component being "Kyoto compatible" which provides the ability to register carbon sequestration rights and potentially create carbon credits available for sale in countries committed to addressing the problems of global warming through greenhouse gas emissions trading.

The investment philosophy of the funds, which are amongst the first vehicles of their type in Australia, is driven by the recognition that an investment in Australian forestry related projects presents an opportunity to supplement core forestry based income returns via complementary revenues, including environmentally sustainable activities such as:

- carbon credit sales;
- biodiversity and dryland salinity offsets via reforestation; and
- renewable energy incomes (e.g.: wind farm rentals and biomass sales).

Supporting Sustainability through Education

Mirvac Group is funding the creation of a Mirvac School of Sustainability at Bond University (QLD). Designed and constructed along ecological sustainable development principles under the direction of Mirvac's internal architecture group HPA, the school will be a focal point for sustainability programs and education.



Mirvac also sponsors the Final Year Student Architecture Exhibition for the RMIT University, Faculty of the Constructed Environment, School of Architecture and Design Technology and a Research Grant.

Mirvac has also included in current budget forecasts sponsorship of a four year undergraduate student scholarship at the University of New South Wales Photovoltaic and Renewable Energy Engineering Department.

Awards and Recognition

In the past five years, Mirvac has received over 40 awards relating to its sustainability achievements alone. These include awards for: energy efficiency, resource efficiency, waste management, environmental management, greensmart housing, urban renewal, heritage and corporate leadership. For 2005, Mirvac was awarded:

Australian Building Greenhouse Rating Leadership Award	Demonstrating leadership using ABGR	NSW
Best Practice Award	Water and energy efficiency	NSW
Energy Smart Champion	Energy efficiency in commercial buildings	NSW
Energy Smart Business Program	Gold Award	NSW
HIA Greensmart	Greensmart Development of the Year	NSW
HIA Greensmart	Greensmart Resource Efficiency Housing Award	National
National Trust of Australia	Corporate/Government Category	NSW
Inaugural Asia Pacific Public Participation Award	Robust Public Participation Process	WA
HIA Greensmart Partnership Award	Mirvac in conjunction with City of Mandurah	WA

2.6 Emissions reduction

What is your firm's current emissions reduction strategy? How much investment have you committed to its implementation, what are the costs/profits, what are your emissions reduction targets and time-frames to achieve them?

As part of a holistic Environmentally Sustainable Development program within Mirvac, objectives and targets for environmental initiatives have been established. Those specifically focused on greenhouse gas reduction include:

- Incorporating building assets over 5000m² gross floor area in Mirvac Energy/Water/Waste and Facility Ecology program.
- Achieving an Australian Building Greenhouse Rating (ABGR) of 3 Stars on all base building properties across the portfolio by 30 June 2008.



- Achieving an Australian Building Greenhouse Rating (ABGR) of 4 Stars or better for new developments included in the program.
- Achieving 5% renewable energy sources across the portfolio as part of energy purchasing by 30 June 2008.
- Instigating the Mirvac Efficient Appliances Now (MEAN) Program for residential development by 30 June 2006.
- Achieving 50% waste diversion across the Mirvac Group by 30 June 2008.

Mirvac is currently in the process of negotiating a national waste management and recycling contractor, to service all Divisions across the Group. As well as providing efficiencies and economies of scale, it will allow Mirvac, for the first time, to track waste generation and assess performance against waste reduction and recycling targets across the entire Group.

Mirvac has also embedded consideration of sustainability risks and opportunities in the development design evaluation process, referred to as D.O.O.R.- 'Designing Out Our Risk'. D.O.O.R. was derived from a national naming competition and was identified by Mirvac design stakeholders as holding significant meaning in that the design review process is seen as an 'open door' or 'revolving door' process involving all design stakeholders working together to analyse the design and explore changes to eliminate or reduce risks or exploit design refinement and opportunity. The D.O.O.R. process ensures that for development within the Group, sustainability is a key part of any design activity undertaken.

2.7 Emissions trading

What is your firm's strategy for, and expected cost/profit from trading in the EU Emissions Trading Scheme, CDM/JI projects and other trading systems, where relevant?

Mirvac does not have any operations covered by the European Union (EU) Emissions Trading Scheme (ETS). However, under its Funds Management Division, Mirvac will continue to investigate the potential to generate compliance greenhouse credits that can be used by entities within the EU ETS in addition to sales of voluntary greenhouse credits outside these schemes. Mirvac's Funds Management Division is already actively investing in Land Use Land Use Change Forestry assets in New Zealand which have the potential to be Classified as Joint Implementation Projects under the Kyoto Protocol.

Mirvac's Funds Management Division is currently in the process of developing the trading and accounting structures for the carbon components of these assets.

In addition, Mirvac has contracted a specialist to review all past and planned investment in energy efficiency for those assets with exposure to the NSW trading scheme, so that options for emissions trading are clearly understood and structured.

Mirvac is in the process of developing its management systems to understand and account for the emissions trading assets accruing to the Group.

For 2005, the assets of Australian Sustainable Investments Fund (ASIF) allowed the generation of 555,673 tonnes of GHG offsets in the form of carbon sequestration credits available for sale. Mirvac holds ownership over 60% of the total number of credits.



2.8 Emissions

What is the quantity in tonnes CO₂e of annual emissions of the six main GHG’s produced by your owned and controlled facilities in the following areas, listing data by country?

For this, the first response from the Mirvac Group to the CDP a detailed assessment has been performed across all Divisions to identify GHG emitting activities, and where valid data is available, quantify emissions.

2.8.1 Scope 1 - Direct Emissions

A number of sources of direct GHG emissions have been identified across the Mirvac Group. These are:

- emissions from on-site gas consumption;
- emissions from hydrofluorocarbon (HFC) emissions from the use of refrigeration and air conditioning equipment;
- emissions from the combustion of fuel from company owned plant and equipment, and
- emissions from standby diesel generators, however this is only a back-up power option in the event of power failures to buildings. No data is currently maintained on fuel consumption from these generators and their use can be considered sporadic.

On-site Natural Gas Consumption

Natural gas consumption data has been recorded for the majority of the Mirvac property portfolio within the Investment and Hotel Divisions. Those properties that are owned, or owned and managed and managed only are included in the calculations.

Total consumption recorded for 2005 from these properties was 86,958,650 MJ, generating 4,464 tonne of CO₂ emissions, 8.2 tonne of GWP-weighted CH₄ emissions and 2.4 tonne of GWP-weighted N₂O emissions.

Year	CO ₂ (tones)	CH ₄ GWP-weighted equivalents (kg)	N ₂ O GWP-weighted equivalents (kg)	TOTAL
2005	4,464	8,218	2,426	4,475
2004	3,125	5,753	1,699	3,133
2003	2,617	4,818	1,422	2,623
2002	2,198	4,047	1,195	2,204



Refrigeration equipment

As an owner and manager of commercial properties and hotels, Mirvac operates and maintains a significant amount of refrigeration and air-conditioning equipment. This equipment is serviced and maintained as part of a Montreal Protocol compliant process, replacing refrigerants as they are phased out under the Protocol with appropriate alternatives that have less or zero ozone depletion and reduced global warming potential.

Whilst Mirvac recognises the GHG emission potential from owned and controlled refrigeration and air-conditioning equipment, it is not currently positioned to confidently report on the extent of these emissions. A centralised record and maintenance database is under construction to assist future reporting.

Current estimates of refrigerants are below. Note that this does not include small packaged units.

Refrigerant Type	Amount
R11	2,719 kg
R12	700 kg
R123	3,255 kg
R134A	3,992 kg
R22	12,364 kg
R410A	85 kg

Plant and equipment

A range of plant and equipment is owned, operated and maintained by Mirvac, principally in the Development Division including air compressors, hoists, tower cranes, forklifts – gas driven and hand driven, sweeping machines, generators, Manitou, loaders, lifts and mobile cranes.

A centralised record of fuel consumption for each plant item is not currently maintained; therefore emissions from these sources are not included in this report. Mirvac recognises this limitation for the 2005 CDP4 submission and will seek to implement a procedure to collate this data for future carbon disclosure reporting.

2.8.2 Scope 2 - In-Direct Emissions from Electricity Purchase

Electricity consumption data has been recorded for the majority of the Mirvac property portfolio within the Investment and Hotel Divisions. Those properties that are owned, or owned and managed or managed only properties are included in the calculations. At this stage, information on properties held in Trusts by the Funds Management Division have been excluded, however, Mirvac part ownership of these properties limits the extent of exposure to GHG emissions of the different property Trusts.

Electricity consumption from construction activities undertaken by the Development Division has been identified as a source of GHG emissions; however data is presently unavailable from this source.



Consumption data from the Investment Division portfolio is captured in real time through a web based remote monitoring system. This system is targeted for implementation across the entire Investment property portfolio including hotels. However, it is also important to note that electricity consumption information applies to the base building only and does not include tenant consumption, this is metered separately. For this report consumption from the Hotels Division was tracked via expenditure. A \$0.10/MJ price was applied to the expenditure data to approximate the consumption from within this Division.

	2005	2004	2003	2002
CO ₂ emissions from purchased electricity	104,078	85,833	75,204	34,564

2.8.3 Scope 3: Other indirect GHG emissions

Vehicle Use

All company vehicles are leased, from one of two lease suppliers. At present the fleet is sourced 50/50 from the two suppliers. Mirvac benefits from the greenhouse gas programs of one supplier, Lease Plan, who participate in the Greenfleet Australia Program. This program offsets the greenhouse gas emissions from Mirvac vehicles leased through its Lease Plan arrangement.

For 2005, a total of 8,135,713km were travelled, resulting in consumption of 189,812 litres of LP gas and 745,921 of petrol. The GHG emissions from this travel were 2,056 tonnes of CO₂.

Air Travel

For this, the first year a response to the CDP has been prepared by Mirvac, emissions from air travel were estimated by analysis of flight sector reports and expenditure. Approximately 80% by expenditure of air travel has been recorded, totalling 5,852,970 km of air travel in the 12-month period to end December 2005, resulting in 687 tonnes of CO₂ emissions.

Waste Disposal

Recognising the environmental and commercial benefits of avoiding the disposal of waste to landfill, the Mirvac Group has set an ambitious target of 50% diversion of all waste to landfill by 30 June 2008. A national waste management strategy is currently under development and will lead to a comprehensive and coordinated national waste management service.

Mirvac will investigate the feasibility of investigating the likely effect of this activity on their greenhouse gas emissions profile, and how this might be accounted for future carbon disclosure reponses.



2.9 Products and services

What are your estimated emissions in tonnes CO₂e associated with the following areas and please explain the calculation methodology employed.

1. Use and disposal of your products and services?
2. Your supply chain?

Mirvac has a number of initiatives in place to reduce GHG emissions from its products and services. Many are outlined within the innovation section of this report, however the following are programs that specifically engage with the Mirvac supply chain, i.e. vertically through material suppliers and through to customers.

EcoSpecifier

Aside from utilising EcoSpecifier (RMIT University Melbourne) to assist in materials selection, Mirvac works with its suppliers and manufacturers in the development of products used in its development projects, and these include performance and sustainability attributes. Recent examples include the development of new plumbing ware which controls the flow and water pressure of hydraulic systems in high rise residential apartment buildings, to ensure performance of AAA rated tap ware for water conservation, the design and installation of solar hot water systems, water tank and water harvesting reticulation systems, and acoustic wall systems.

Efforts are ongoing to understand the quantitative greenhouse gas emission implications of these measures and their affect on Facility Ecology which includes indoor air quality.

Mirvac Efficient Appliances Now (MEAN)

This innovative program is about to be launched and is designed to encourage energy/water efficient appliance choices for all customers of Mirvac residential development property. Customers have the opportunity to purchase high quality, energy and water efficient appliances for their Mirvac properties at discounted wholesale prices available to Mirvac.

2.10 Energy costs

What are the total costs of your energy consumption, e.g. fossil fuels and electric power? Please quantify the potential impact on profitability from changes in energy prices and consumption.

Given the incomplete records from across the Group, a total energy cost base has not been determined. With planned initiatives, tracking and reporting on energy consumption and GHG emissions, it is anticipated that this figure will be available for reporting in the future.

2.11 Acknowledgements

This report was produced with the assistance of Hyder Consulting.





Appendix 1

Data Tables



Emission	2005	2004	2003	2002	Calculation Method	Notes
Scope 1 - Direct Emissions						
On-site gas consumption	4,475	3,133	2,623	2,204	Calculation Tool for Direct Emissions from Stationary Combustion, July 2005. Version 2.0.	Limited data available
Refrigeration & air-conditioning	Not calculated					
Plant and equipment						
On-site back-up generators						
Scope 2 - In-Direct Emissions						
Purchased electricity	104,078	85,833	75,204	34,564	Indirect CO ₂ Emissions from the Consumption of Purchased Electricity, Heat, and/ or Steam. Version 1.1, April 2006.	Consumption from the Hotels Division is tracked via expenditure, with a \$0.10/MJ price applied.
Scope 3 – Scope 3: Other indirect GHG emissions						
Vehicle Use	8,135,713 km travelled 2,056 tonnes of CO ₂ emissions.	Not calculated	Not calculated	Not calculated	Indirect CO ₂ Emissions from Business Travel (Scope 3). Version 1.2. August 2005.	Distance travelled converted to estimated fuel consumed based on conversation from AGO Factors and Methods Workbook 2005.
Air Travel	5,852,970 km travelled 687 tonnes of CO ₂ emissions.	Not calculated	Not calculated	Not calculated	Indirect CO ₂ Emissions from Business Travel (Scope 3). Version 1.2. August 2005.	Only 80% of travel expenditure tracked and reported. The Hotels Division tracked separately, with only an average sector distance and number of flights recorded.
Waste Disposal	Not calculated	Not calculated	Not calculated	Not calculated		