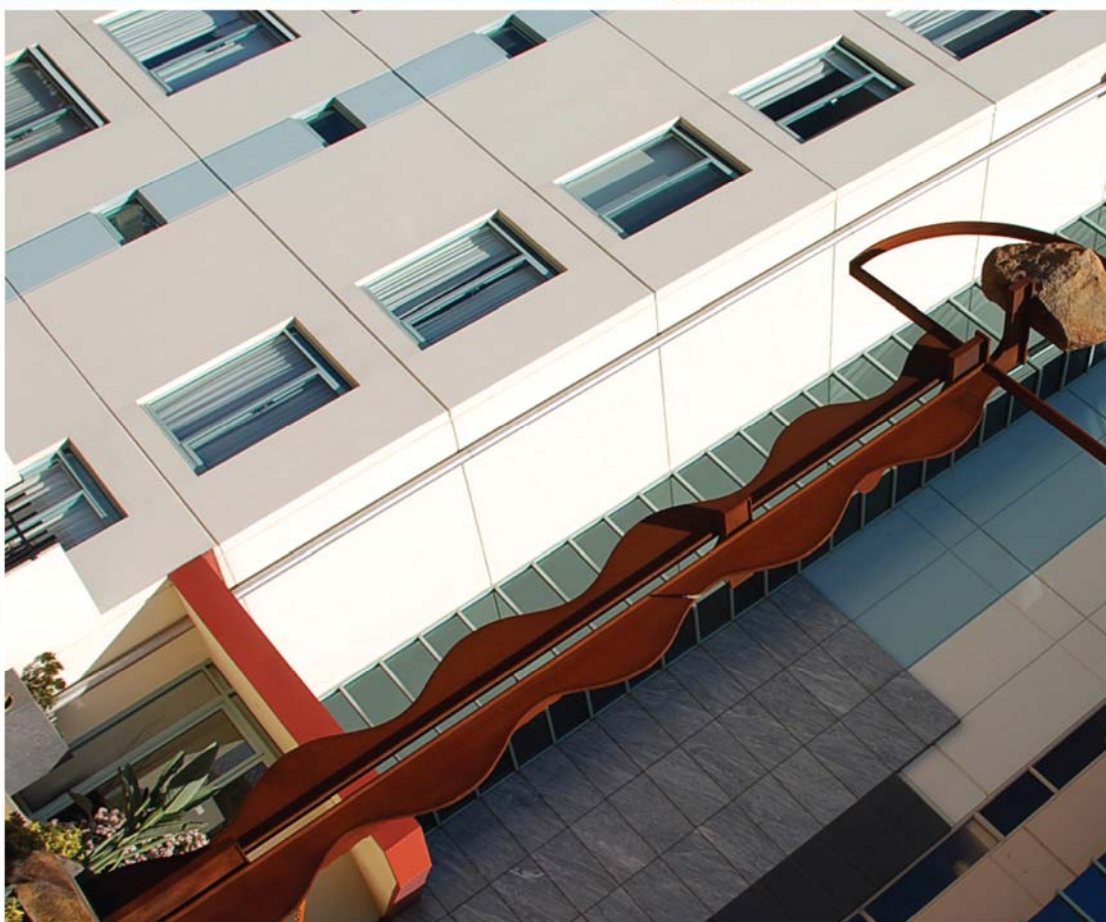
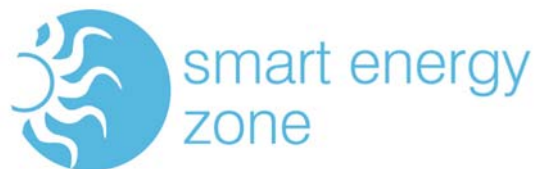




Doncaster Hill Smart Energy Zone



Action Plan
Published August 2009.



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Glossary of terms / abbreviations

acronym	description
Climate 2020	Manningham's climate and energy action plan to achieve a 'climate wise community by 2020'.
CO ₂ / eCO ₂	Short form common term for carbon footprint or greenhouse gas emissions
CSIRO	Commonwealth Scientific and Industrial Research Organisation
GHG	Greenhouse Gas Emissions
HVAC	Heating Ventilation and Air Conditioning Systems
ICLEI	Local Governments for Sustainability (formerly International Council for Local Environmental Initiatives)
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt Hour - a measure of energy used over time
LCADesign	LCADesign software package is a real time environmental impact calculator for commercial property that works directly from the building designer's model.
MRET	Mandatory Renewable Energy Target has the objective of fostering 20 per cent displacement of coal fired energy generation with renewable generation by 2020
MWh	Megawatt hour- a measure of energy used over time. 1 MW = 1000kW
NABERS	NABERS is a performance based rating system for existing buildings.
NAGA	Northern Alliance for Greenhouse Action comprising of the Moreland Energy Foundation Limited and nine member councils: Banyule, Darebin, Hume, Manningham, Melbourne, Moreland, Nillumbik, Whittlesea and Yarra
SDS	Sustainable Design Scorecard - an assessment tool for improving the environmental performance of non-residential buildings developed by Port Phillip City Council
SEZ	Doncaster Hill Smart Energy Zone
STEPS	'Sustainable Tools for Environmental Performance Action Plan' – an assessment tool for improving the environmental performance of new residential buildings developed by Moreland City Council
stationary energy	All energy production and consumption including electricity and direct uses of energy for heating and industrial processes but excluding transport.
SV	Sustainability Victoria
transport energy	Energy used for transport – typically petrol, diesel and LPG
VEET	Victorian Energy Efficiency Target
VRET	Victorian Renewable Energy Target

The Vision

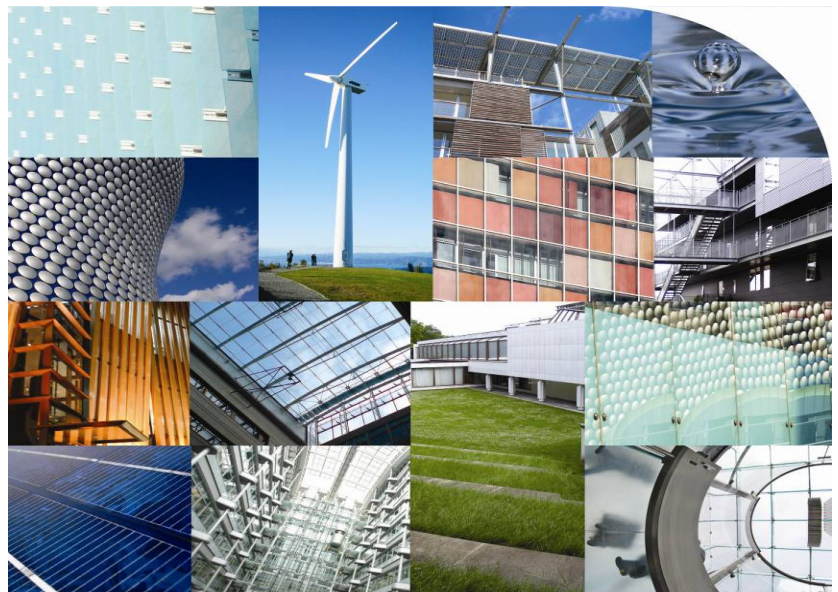
Doncaster Hill will become an internationally recognised urban environment embracing total sustainability in terms of energy, water, transport, built environment and landscape. Living and working in Doncaster Hill, people will enjoy improved quality of life as this resident attests to in their account of daily life:

I wake up in the morning to views across metropolitan Melbourne, pleased with my contribution to the long term sustainability of this City because I live in a 6 star Green Star rated apartment with natural ventilation and daylight, made from materials with low embodied energy, high efficiency lighting and appliances and a sense of community among my neighbours as we monitor our own energy usage through smart meters installed inside the front door of our apartments. I love the fact we don't need air conditioning and we can log onto the internet and see how our building and precinct is performing in the Doncaster Hill sustainable housing rewards program.

As I leave for work I marvel at how attractive the outside of my building looks, much like apartment buildings outside Doncaster Hill, yet it is the workhorse for powering our building. The integrated solar photovoltaic panels form part of the glazing and wall cladding, capturing energy from the sun and converting it to electricity. On occasion we need to draw 100 per cent GreenPower from the grid, but generally all our power comes from our solar panels, or better still we sell our excess power back to the electricity company with the proceeds going towards resident barbecues or our recent roof top garden improvements.

Today I'm walking to work because the weather is pleasant. However, I'm glad I live in Doncaster Hill, home to Melbourne's largest bus transport interchange, and I can easily catch the bus to work, the city and across town via the orbital bus route to Dandenong, Greensborough, Footscray, Ringwood and Frankston (to name a few) with the seamless transition between bus, train, tram and cycling networks. I ditched my car years ago!

Heading down Doncaster Road I check the Doncaster Hill community energy meter which shows how much energy is being generated by the distributed energy facilities in Doncaster Hill, including: the mini wind turbines on light poles, solar array on top of the offices, residential apartment buildings and the local shopping centre, and pneumatic sensors installed underneath the roads of Doncaster Hill. It also shows the amount of energy being consumed with Doncaster Hill compared to the rest of metropolitan Melbourne. I'm excited about the fact I'm living amongst the action. We at Doncaster Hill are achieving new things, having been given the flexibility by the state and federal governments to test and pilot the latest technology, and with new legislation allowing Melbourne to make the necessary transition to a sustainable city.



As I pass the Sustainability Power House (SPH), Council's

sustainability information centre, I notice Council's biomass plant, which converts waste into electricity, is performing at full capacity and the water storage levels from the recycling stormwater program have boosted our water supply so we can again water our sports ovals and parks. Having green grass and big street trees has meant walking to work is generally a daily pleasure, rain, hail or shine. The SPH has been instrumental in helping people like me understand sustainability and open our eyes to the possibilities available by thinking about the appliances we put in our home, the type of housing we live in, how we get to work and how I can even help reduce the carbon footprint of my workplace. Local schools are also heavily involved in demonstration projects with Council, residents and businesses, helping build projects, plant trees and promote sustainable living. I've met new people and feel more like I'm a part of something bigger.

Just past the SPH I come to the business precinct where I find people to help put a roof top garden on our apartment building (complete with vegie patch!). The architect for our building is here, as is the 'green' plumber and the solar electric bicycle store.

Doncaster Hill may not look much different to other places in Melbourne but we are quietly doing our bit to live more sustainably and teach others about it. And we enjoy the cost savings, along with the health and wellbeing benefits that come with the Doncaster Hill lifestyle.

1 Introduction

1.1 Sustainability Victoria's Smart Energy Zone program

Doncaster Hill has been selected by Sustainability Victoria (SV) as a *Smart Energy Zone*. Manningham City Council and SV are project partners in the preparation of a sustainable energy road map to develop Doncaster Hill as a Smart Energy Zone.

Smart Energy Zones aim to demonstrate:

- There are significant benefits in energy solutions integrating the demand side and supply side technologies for multiple building sites
- Innovative distributed energy models are viable and have the potential to significantly cut greenhouse emissions and increase security now and in the future
- Communities can play an important role in meeting their own energy needs

The Smart Energy Zones initiative will provide a range of projects demonstrating the benefits of integrating multiple technologies in one location for greater energy efficiency and security. Smart Energy Zones aim to harness the growing community interest towards sustainability and, working with stakeholders, agendas and options aligning community needs with appropriate sustainable solutions will be generated. Such a zone could include:

- Local energy generation, including cogeneration and small scale renewables
- Microgrids for distributing electricity, heating and cooling
- Energy efficiency measures
- Smart meters
- Energy storage
- Innovative electricity tariffs

1.2 Progressing Doncaster Hill as a Smart Energy Zone

The aim of the Doncaster Hill Smart Energy Zone – (SEZ) Action Plan is to formulate a sustainable energy road map, applicable at all scales - sites, precincts, across precincts and whole of Doncaster Hill - in pursuit of three objectives:

1. Reducing energy demand and greenhouse emissions
2. Embracing local sustainable energy generation
3. Innovating - establishing Doncaster Hill as a sustainability laboratory

The SEZ Action Plan includes analysis of how different development sectors – residential, retail and commercial - can improve efficiencies in buildings and reduce occupant demand for energy. This is supported by recommendations for priority projects to be undertaken to instigate greater renewable energy usage in the precinct, and other legislative and non-legislative mechanisms to bring about change so Doncaster Hill moves towards its vision of becoming a renowned sustainable urban precinct.

This report is structured into a number of chapters. For a summary of the key elements of the SEZ Action Plan refer Chapters 1, 2 and Appendix 4: SEZ Wheel, located on the inside back cover. Below is an outline of all chapters:

SEZ Action Plan	Chapter 1 – Introduction Provides background on the Sustainability Victoria initiative - Smart Energy Zones - and an outline of each of the chapters in the SEZ Action Plan.
	Chapter 2 – Smart Energy Zone Action Plan Outlines the strategic framework, the Action Plan, and necessary programs and budget to drive implementation.
Background	Chapter 3 – Existing Doncaster Hill Policies and Legislation Provides an understanding and summary of the Doncaster Hill Strategy . Coming into effect in 2002, the Strategy is supported by a range of sustainability guidelines and planning scheme policies. Some of the other legislative options for guiding the development of Doncaster Hill's Principle Activity Centre are also identified.
	Chapter 4 – Doncaster Hill's People and Organisations Outlines the people and organisations within Doncaster Hill and the sustainability programs being undertaken.
	Chapter 5 – Smart Energy Zone Program Workshops Provides a summary of key outcomes from workshops undertaken by Sustainability Victoria and Manningham City Council on the future possibilities for Doncaster Hill's Smart Energy Zone.
	Chapter 6 – Case Studies Outlines a range of case studies looking at zero net emission urban precincts, small scale renewable energy facilities, ecologically sustainable development (ESD) projects and climate change plans, nationally and internationally. These represent a range of government and private developer projects relevant to opportunities identified for Doncaster Hill.
Current Status	Chapter 7 – Energy Base Case Outlines the energy base case for future development of Doncaster Hill. This chapter analyses growth in the residential, commercial, retail and community/miscellaneous development sectors, what the projected energy requirements are based on business as usual, and the associated greenhouse gas emissions impacts.
Objectives	Chapter 8 – Reducing Energy Demand and GHG Emissions Details the strategies for reducing energy demand and greenhouse gas emissions (GHG) for each of the key development sectors - residential, commercial and retail - and improvements to reduce greenhouse gas emissions across the Doncaster Hill precinct.
	Chapter 9 – Embracing Local Sustainable Energy Generation Analyses opportunities for renewable energy sources and distributed energy projects and their applicability to development in Doncaster Hill.
	Chapter 10 – Implementation Opportunities Provides a summary of options available to Council for facilitating distributed energy projects in Doncaster Hill. This chapter also includes a discussion of the legislative and non-legislative methods for implementing the energy plan.

1.3 Key Recommendations

The key recommendations of this project can be summarised as follows:

- Council needs to be the champion, leading by example, promoting the business case for change and providing a capacity building role in the resident, working and development community of Doncaster Hill.
- Encouraging a range of iconic energy projects in Doncaster Hill from both the public and private sectors contributing to making Doncaster Hill a locally, nationally and internationally recognised sustainable urban precinct.
- Investing time and energy into challenging the legislative barriers restricting Council's pursuit of sustainability objectives, in particular, focusing on opportunities to establish Council as an energy supplier and retailer, introducing clear and more stringent building and appliances efficiencies in Doncaster Hill, and requiring all buildings to connect to GreenPower from the grid where locally renewable energy sources are not available/possible.

Council already has sound planning policies encouraging private developers to go beyond minimum compliance for sustainability measures in new projects. While development is progressing in Doncaster Hill there are greater opportunities to reduce energy demand, advance renewable energy use coupled with efficiencies in the design, construction and occupation of spaces.

There are a number of legislative barriers to Manningham implementing increased stringency on building energy efficiency. While, more broadly, there are legislative and financial challenges for setting up renewable energy facilities and feeding any excess energy to the grid, and the local resident, working and development communities embracing the energy changes necessary to address climate change impacts.

Key findings produced from a background analysis of this project include:

Issues	Opportunity
Fragmentation and incremental development of the precinct.	Co-ordinating different developers and developments to work together
Lack of monitoring tools and information about energy usage	Implement smart metering and monitoring
Planning policy does not designate targets as such there are no mandated targets regarding energy / greenhouse gas emissions	Existing planning policies require development to go beyond compliance, however, special legislation may be required to provide the impetus for developers
Lack of willingness of developers to embrace sustainable energy requirements	Tackle the issue supportively through education, incentives and knowledge sharing
Each development happens in isolation of other developments	Proactively seek out and link developers, and co-ordinate solutions on a precinct wide basis
Development is expected to occur incrementally over the next 22 years	Implementation of modules of the SEZ plan, particularly where district solutions are proposed

2 The Smart Energy Zone Action Plan

2.1 Introduction

The Smart Energy Zone (SEZ) Action Plan is the key implementation tool to direct how the future demand for energy will be managed so Doncaster Hill can become a living, breathing sustainable urban environment.

There is a clear imperative for urban environments to be better designed, constructed and inhabited to reduce environmental impact, with particular regard to how energy is generated and consumed so greenhouse gas emissions are minimised. Climate responsiveness is at the core of Council's policies; in particular, there is a strong foundation within the state and local sections of the Manningham Planning Scheme to facilitate sustainable building design.

2.2 Scope

The SEZ plan focuses on reducing what is called 'stationary energy', the energy consumed for all uses other than transport. In fact, the SEZ plan aims foremost to reduce dependence on electricity sourced from coal fired power stations and, to a much lesser extent, on gas. However, this stationary/ transport boundary will become blurred in the next few years with increased demand for and supply of electric vehicles.

2.3 Why a SEZ plan?

Without a plan to reduce greenhouse emissions for Doncaster Hill it is predicted energy demand will increase threefold, to 300,000 GJ/a by 2031.

However, implementation of the SEZ Action Plan will lead to a 21 per cent reduction in energy demand and 18 per cent less greenhouse emissions (refer Figures 1 and 2).

Figure 1 – Reduced Energy Usage by Sector

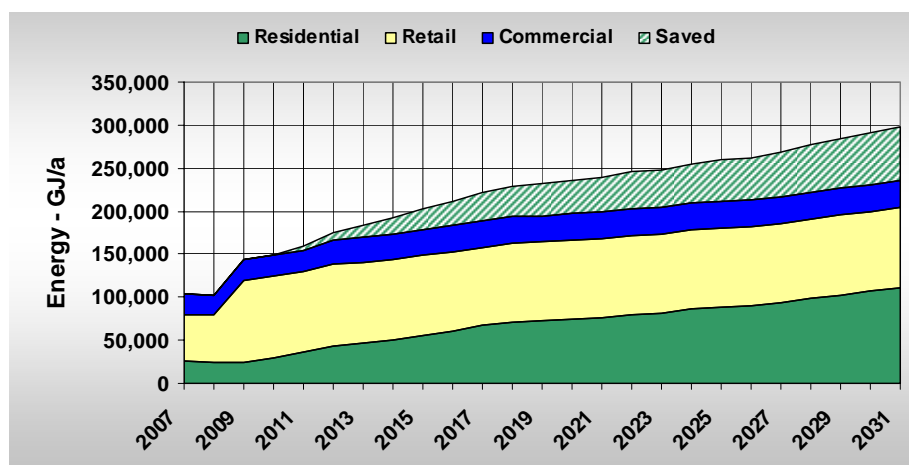
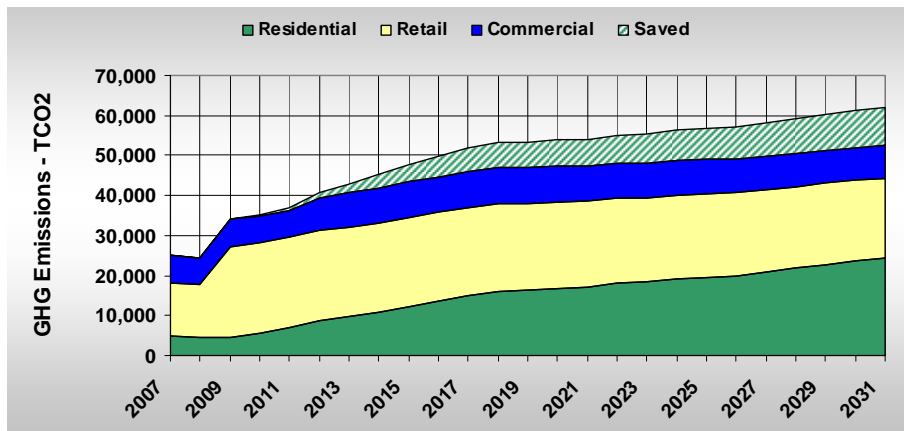


Figure 2 – Reduced GHG Emissions by Sector

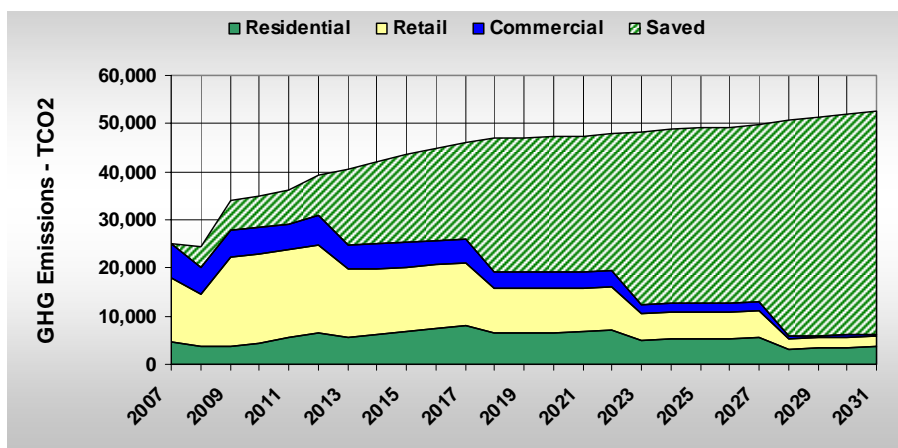


2.3.1 Further Reducing Greenhouse Gas Emissions

While the SEZ Plan outlines ways to reduce demand, there will always be residual demand for energy relying on traditional coal generated power unless renewable sources are used. To achieve substantial reductions in GHG emissions it will be necessary to find other ways to reduce emissions, with the potential to include alternative power sources using an array of technology (refer Chapter 9) within Doncaster Hill or buying accredited GreenPower from the electricity grid.

Figure 3 demonstrates a combination of reducing demand for energy and incremental increases in alternative energy sources Doncaster Hill can become a zero emissions precinct. Based on the overall greenhouse gas emissions reductions that may be achieved through efficiency improvements to building fabric, building appliances and behaviour, there is still a demand for energy. This demand should be met by an array of alternative or 'GreenPower' options with the aim of Doncaster Hill reducing its emissions impact to zero by 2031. The following graph demonstrates an incremental rise of 20 per cent of all power being sourced from alternative sources every five years.

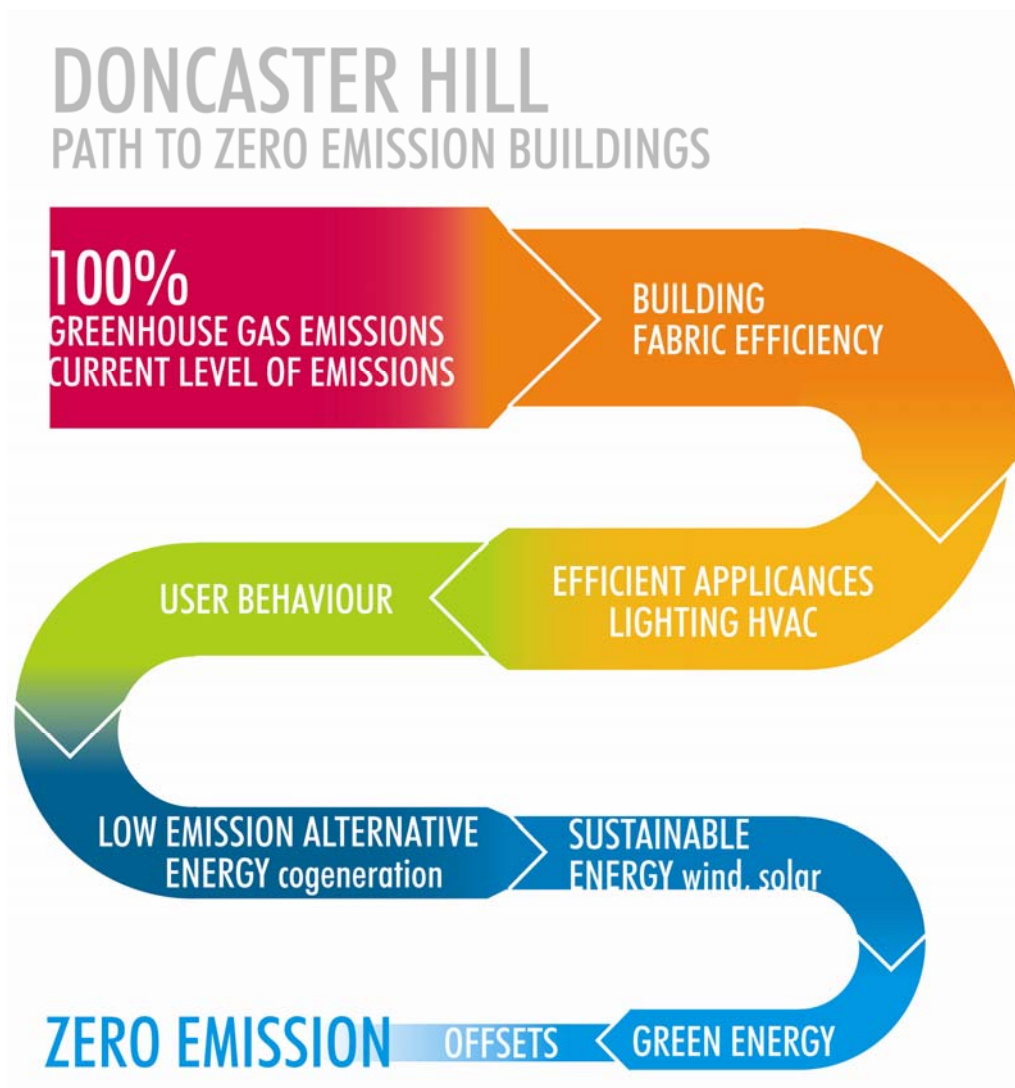
Figure 3 – Greenhouse Gas Emissions Reduction Based on Use of Renewable Energy Sources



2.4 Pathway to Zero Net Emissions

The pathway to zero net emissions comprises six steps:

1. Improved building design to reduce requirements for heating, cooling, ventilation and lighting
2. Developers select highly efficient heating, cooling, lighting, domestic hot water systems and fixed appliances
3. Tenants / residents select highly efficient appliances
4. Tenants / residents operate equipment to minimise energy consumption
5. Renewable and low carbon energy sources, preferably local, used where practical/economical
6. Carbon offset the remainder



2.5 Strategic Framework

The SEZ Action Plan is underpinned by a single strategic framework consistent with and progressing the Doncaster Hill Strategy. It provides a pathway to zero emissions from buildings by 2030.

2.5.1 The Vision

Doncaster Hill will become an internationally recognised urban environment embracing total sustainability in terms of energy, water, transport, built environment and landscape. Living and working in Doncaster Hill, people will have improved quality of life as many residents attest to in their account of daily life.

2.5.2 The Goal

Significantly reduce greenhouse gas emissions generated from the operation of buildings in the Doncaster Hill precinct and achieve zero net emissions by 2030.

2.5.3 Three Objectives

1. Reduce energy demand and greenhouse emissions
2. Generate as much alternative and renewable energy within the precinct as possible
3. Establish Doncaster Hill as a sustainability laboratory

2.5.4 Eight Key Strategies

Extensive and targeted consultation, and research identified eight key strategies to drive the delivery of the three SEZ objectives, and a broad range of implementation actions (refer Appendices 1 and 2).

Governance	Investigate and develop the necessary structures and arrangements - organisational, legislative and non-legislative - to drive delivery of SEZ goals and objectives
Leadership and Learning	Establish the necessary conditions supporting innovation and the emergence of Doncaster Hill as a sustainability laboratory at all levels - technology, policy, urban planning, legislative arrangements, business, research and education
Sustainable Building Design and Construction	Promote, support and facilitate leading practice
Local Economy	Encourage the development of innovative businesses providing sustainable products and services with plenty of local jobs
Place Making	Promote Doncaster Hill as a centre for sustainability.
Education and Capacity Building	Design and deliver programs supporting strong, informed, capable, resilient and willing communities
Operational Performance	Continuous improvement through open and transparent monitoring of actual performance
Funding	Attracting ongoing funding through traditional and innovative mechanisms

2.6 Program Approach to Implementation of the SEZ Action Plan

Three programs have been designed to deliver six of the eight key strategies and associated actions:

Program Name	Description	Associated Strategy	Budget
Smart Energy Zone	Co-ordinate and implement the SEZ Action Plan, in particular, identify opportunities and barriers to implementing distributed intelligent energy systems, smart meters, intelligent HVACs and building energy management systems, and continuously improving operational performance of buildings	Governance Leadership and Learning Operational Performance Funding	\$38,000 per year for three years
Accelerating Sustainable Building (ASB)	Establish Doncaster Hill area as a leader in sustainable buildings and intelligent distributed energy systems by adopting the necessary tools (i.e. NABERS, LCADesign), driving the implementation of intelligent distributed energy generation, smart meters, intelligent HVACs and building energy management systems, and continuously improving the SMP process and tools supporting improved design, tendering, construction and operation of buildings within Council's capital works and the wider municipality	Sustainable Building – Design and Construction	\$42,000 per year for three years
Green Business Catalyst	Identify and develop the necessary strategies to attract existing sustainable businesses, nurture new businesses, forming strategic partnerships and attract funding	Local Economy	\$30,000 seed funding for one year

The two remaining strategies will be delivered through existing programs:

Program Name	Description	Associated Strategy	Budget
Get Climatewise Now!	Design and delivery of community education programs with a focus on climate and energy action. Includes Get Climatewise Now! workshops, CRAGs and residential bulk buy program	Education and Capacity Building	Existing program
Doncaster Hill Place Making	Aims to establish a sense of place and identity for the Doncaster Hill principal activity centre	Place Making	Existing program

More detailed information is contained in the appendix:

Appendix 1 SEZ Implementation plan

Appendix 2 Program Briefs

- 2.1 - SEZ Co-ordination and implementation
- 2.2 - Accelerating Sustainable Building
- 2.3 - Green Business Catalyst

Appendix 3 SEZ Programs and Budgets

Appendix 4 - Smart Energy Zone Wheel – A Strategic Framework

2.7 Key Actions

While there are many initiatives identified, some of the key actions are listed below.

Governance	Establish the appropriate structures to progress SEZ objectives and attract funding.
Leadership and Learning	The new Civic Precinct development provides Council with the opportunity to demonstrate leadership by building a leading sustainable building and transforming the Civic Precinct into a Smart Energy Zone. The transformed SEZ Civic Precinct would incorporate local sustainable energy generation, microgrids to share electricity, power and heating between buildings, smart metering, energy efficient building envelope (5 star NABERS or better), building energy management system with intelligent HVAC, energy efficient lighting, open and transparent reporting of energy performance, and ongoing building energy management.
Leadership and Learning	Gain state and federal government support to designate Doncaster Hill as an area where regulations may be varied to allow innovative sustainability initiatives to be implemented and trialled.
Accelerating Sustainable Building	Establish Doncaster Hill area as a leader in sustainable buildings and intelligent distributed energy systems by adopting the necessary tools (i.e. NABERS performance rating tools, LCADesign), implementing intelligent distributed energy generation, smart meters, intelligent HVACs and building energy management systems, and continuously improving the SMP process and tools supporting improved design, tendering, construction and operation of buildings both within Council's capital works and the wider municipality.
Green Business Catalyst	Establish the necessary conditions, structures, support and partnerships attracting and nurturing the development of innovative businesses that provide products and services in a sustainable manner, thrive and prosper in the emerging new 'green' economy, and generate local employment.
Place Making	Establish iconic projects that have a visible presence on Doncaster Hill and draw attention to the area as a sustainability precinct.

2.8 SEZ Wheel – A Strategic Framework

The key elements of the SEZ Action Plan have been illustrated as a graphic - Smart Energy Zone Wheel (refer Appendix 4).

2.9 Reporting and Review of SEZ Action Plan

Annual reports will be prepared for Council outlining progress to date. It is recommended the SEZ Action Plan is reviewed every three years.

3 Existing Doncaster Hill Policies and Legislation

3.1 Doncaster Hill Strategy

The Doncaster Hill Strategy applies to a 58 hectare area (Figure 4) defined as the Doncaster Hill Principal Activity Centre under Melbourne 2030. The Strategy provides a framework for all planning and development to take place. It incorporates Ecologically Sustainable Development (ESD) based on a triple bottom line approach, promotes appropriate urban densities and provides mixed use guidelines. The Strategy sets out 'The Vision', strategic context and objectives, development application requirements, and ESD and urban design requirements.

The Doncaster Hill area has seven precincts (Figure 5) and each has a unique character and future vision. It is expected investment totalling \$45 million will be made in public infrastructure within Doncaster Hill

Figure 4 – Study Area

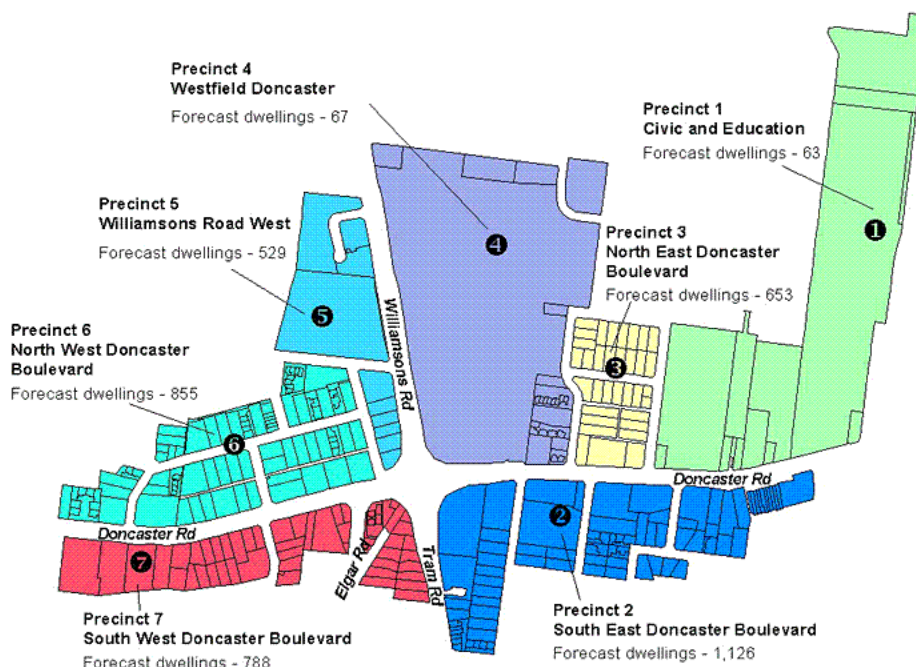


The Strategy predicts substantial shifts in residential, retail and commercial development in Doncaster Hill by 2031:

- 4080 new dwellings housing 8,300 residents (refer Figure 5)
- 20,000m² additional commercial floor space
- 10,000m² additional retail floor space (excludes Westfield)

The Strategy proposes to manage and facilitate the projected shifts by encouraging balanced, healthy and sustainable land use and development. The concept of a Sustainable Urban Village, a key element of the Doncaster Hill strategy vision, will accommodate such change as it is based on the urban village form, ESD principles, land form guidelines, density guidelines, activated edges, and mixed use guidelines.

Figure 5 – Precinct Map



Source: http://www.doncasterhill.com/About_Location.htm

Development in the Civic Precinct (within Precinct 1) will include:

- Multipurpose community centre and civic forecourt (stage 1)
- Family services centre (stage 2)
- Green spine and redevelopment of municipal office (stage 3)
- Transport – modal interchange (transport and community information hub) incorporating Smart Bus and Doncaster Area Rapid Transit (DART) services to commence in 2010

3.2 Doncaster Hill Sustainability Guidelines

The Doncaster Hill Sustainability Guidelines provide a framework to assist applicants to prepare a Sustainability Management Plan (SMP) pursuant to Clause 21.21 *Doncaster Hill Activity Centre* and Clause 22.13 *Doncaster Hill Activity Centre Sustainability Plan Policy* of the Manningham Planning Scheme. The Guidelines are designed to promote, encourage

and direct growth within the Doncaster Hill vision and will act to further the Doncaster Hill concept from research and policy to practical implementation at ground level. The Guidelines are based on eight Ecologically Sustainable Development principles:

1. Water Conservation and Reuse
2. External Building Materials
3. Interior Materials Analysis
4. Waste Minimisation and Avoidance
5. Quality of Private and Public Realms
6. Integrated Traffic and Transport Management
7. Construction and Demolition Management

The Guidelines present background information on the advantages of sustainable development, introduce the Sustainable Design Taskforce and its functions, maps out the planning process in the context of SMPs promoting an integrated design approach, provides a design and management matrix and reference to other relevant guidelines to be considered, includes a user friendly explicit design checklist, and descriptive sustainable design objectives. The sustainable design objectives cover the following focus points:

- Building energy management
- Water sensitive urban design
- Construction materials
- Indoor environment quality
- Waste management
- Quality of public and private realm
- Transport
- Construction and demolition

3.3 Legislative opportunities

Doncaster Hill Local Law comes into effect from 1 July 2008. It comes from the Doncaster Hill Strategy and sets a standard for the visual appearance of poorly maintained properties impacting on the overall amenity of the Doncaster Hill Precinct (refer Doncaster Hill Local Law Fact Sheet). Council is authorised to issue a Notice to Comply to owners of unsightly or unsafe sites, who will then be required to prepare a Land Management Plan for the site.

Building Act 1993

The *Building Act 1993* relates to the construction of buildings and built form with regard to regulations and standards. Section 4 (1) sets out objectives of the Act:

- To protect the safety and health of people who use buildings and places of public entertainment
- To enhance the amenity of buildings
- To promote plumbing practices which protect the safety and health of people and the integrity of water supply and waste water systems
- To facilitate the adoption and efficient application of:
 - National Building Standards
 - National Plumbing Standards
- To facilitate the cost effective construction and maintenance of buildings and plumbing systems
- To facilitate the construction of environmentally and energy efficient buildings

- To aid the achievement of an efficient and competitive building and plumbing industry

This clearly indicates the Act considers energy efficiency and recognises the importance of sustainable buildings.

Energy Efficiency Opportunities Act 2006

The Energy Efficiency Opportunities Act 2006 took effect on 1 July 2006 (with an amendment in March 2007). It aims to improve the identification and evaluation of energy efficiency opportunities by large energy using businesses and, as a result, to encourage implementation of cost effective energy efficiency opportunities.

In order to achieve its aim, the Act requires large energy using businesses to:

- *Undertake an assessment of their energy efficiency opportunities to a minimum standard in order to improve the way in which opportunities are identified and evaluated*
- *Report publicly on the outcomes of that assessment in order to demonstrate to the community that those businesses are effectively managing their energy*

The Act outlines the broad requirements for large energy using businesses, and allows for Regulations to provide detailed requirements for assessment, reporting, verification and other elements of the program.

(<http://www.energyefficiencyopportunities.gov.au/index.cfm?event=object.showContentandobjectid=CB1EA79C-D56D-2C65-A3C2BC31E68863BF>)

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Local Government Act 1989

The *Local Government Act 1989* sets out the Local Government Charter, providing an operating system for councils to perform relevant functions and exercise good governance. The purpose of the Act is '*...to provide a system under which Councils perform the functions and exercise the powers conferred by or under this Act and any other Act for the peace, order and good government of their municipal districts.*'

The key objectives of a Council include:

- (1) The primary objective of a Council is to endeavour to achieve the best outcomes for the local community having regard to the long term and cumulative effects of decisions.
- (2) In seeking to achieve its primary objective, a Council must have regard to the following facilitating objectives:–
 - (a) To promote the social, economic and environmental viability and sustainability of the municipal district
 - (b) To ensure that resources are used efficiently and effectively and services are provided in accordance with the Best Value Principles to best meet the needs of the local community
 - (c) To improve the overall quality of life of people in the community
 - (d) To promote appropriate business and employment opportunities
 - (e) To ensure that services and facilities provided by the Council are accessible and equitable

In order to achieve these objectives, the functions of a Council are defined and include the following:

- (a) Advocating and promoting proposals which are in the best interests of the local community
- (b) Planning for and providing services and facilities for the local community
- (c) Providing and maintaining community infrastructure in the municipal district
- (d) Undertaking strategic and land use planning for the municipal district

- (e) Raising revenue to enable the Council to perform its functions
- (f) Making and enforcing local laws

Sustainability Victoria Act 2005

This Act establishes Sustainability Victoria, where the objective is, pursuant to Part 2 Section 6 '*to facilitate and promote environmental sustainability in the use of resources*'. It sets out the functions of Sustainability Victoria, including:

- Facilitate the implementation of environmentally sustainable measures in all sectors of the Victorian economy, including local government, business and households
- Provide information and advice on the efficient use of energy, including renewable energy, and the resulting benefit to all sectors of the Victorian community
- Facilitate the development of voluntary environmental sustainability initiatives
- Develop, and contribute to the development of plans, guidelines, codes of practice and reports on issues relating to environmental sustainability
- Monitor and evaluate research and development on environmental sustainability issues, including resource efficiency and renewable energy

Planning and Environment Act 1987

The *Planning and Environment Act 1987*, sets out the objectives for planning in Victoria, along with the administration processes and criteria to determine planning land use and development decisions. The purpose of the Act is to '*....establish a framework for planning the use, development and protection of land in Victoria in the present and long term interests of all Victorians*'.

As specified in the *Planning and Environment Act* the key objectives for planning in Victoria include:

Section 4 (1):

- (a) To provide for the fair, orderly, economic and sustainable use, and development of land
- (b) To provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity
- (c) To secure a pleasant, efficient and safe working, living and recreational environment for all Victorians and visitors to Victoria
- (d) To conserve and enhance those buildings, areas or other places which are scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value
- (e) To protect public utilities and other assets and enable the orderly provision and coordination of public utilities and other facilities for the benefit of the community
- (f) To facilitate development in accordance with the objectives set out in paragraphs (a), (b), (c), (d) and (e)
- (g) To balance the present and future interests of all Victorians

The underlying vision of these principles and objectives are to ensure legislation and subordinate legislation is created and maintained appropriately to focus on protecting the environmental, social and economic feasibility of Victoria.

Section 4 (2) of the *Planning and Environment Act 1987* states the planning framework objectives should seek (among other things):

- (a) To ensure sound, strategic planning and co-ordinated action at State, regional and municipal levels
- (b) To establish a system of planning schemes based on municipal districts to be the principal way of setting our objectives, policies and controls for the use, development and protection of land

- (c) To enable land use and development planning and policy to be easily integrated with environmental, social, economic, conservation and resource management policies at state, regional and municipal levels
- (d) To ensure the effects on the environment are considered and provide for explicit consideration of social and economic effects when decisions are made about the use and development of land
- (e) To facilitate development achieving the objectives of planning in Victoria and planning objectives set up in planning schemes
- (f) To provide for a single authority to issue permits for land use or development and related matters, and co-ordinate the issue of permits with related approvals
- (g) To encourage the achievement of planning objectives through positive actions by responsible authorities and planning authorities;
- (h) To establish a clear procedure for amending planning schemes, with appropriate public participation in decision making
- (i) To ensure those affected by proposals for the use, development or protection of land or changes in planning policy or requirements receive appropriate notice

These planning framework objectives are broad and assist in providing the basis for sustainable land use and development at the state and local level. They form the legislative framework planning schemes are based on.

3.4 Planning Scheme

A planning scheme is subordinate legislation, and the key regulatory tool for guiding land use and development in Victoria. It is a legal document administered by local government and approved by the Planning Minister. It sets out state and local planning objectives and controls.

3.5 Planning Scheme Policies

Relevant policies of particular significance to elements of sustainability include Clause 21.21, Clause 22.13, Schedule 1 to the Comprehensive Development Zone, Clause 43.02 Schedule 6 to the Design and Development Overlay, and Clause 45.06 Schedule 1 to the Development Contributions Plan Overlay. Together these policies seek development extending 'beyond compliance', encouraging higher level sustainability in the design, construction and occupation of new development.

It is important to note Amendment C33 to the Manningham Planning Scheme introduced the local planning policy Doncaster Hill Activity Centre Sustainability Management Plan along with other planning scheme modifications. It was introduced on 26 February 2004. Subsequently, decisions since then have required applicants to submit a Sustainability Management Plan, endorsed as part of the planning permit.

Key elements of Manningham Planning Scheme provisions are outlined below:

3.5.1 Municipal Strategic Statement

Clause 21.21 – Doncaster Hill Activity Centre

The underlying foundation of Clause 21.21 is based on sustainability and integrated land use and development planning. It explicitly states the Doncaster Hill Activity Centre *'will be a high density, sustainable, vibrant, contemporary mixed use urban village with a strong sense of place and civic identity based on the following key vision objectives':*

- *To implement the objectives of Melbourne 2030 in respect of Principal Activity Centres*
- *To integrate ecologically sustainable development principles and techniques into every facet of the design, construction and operation/occupancy stages of new development to raise the aspirations of all users, appropriate for a city looking towards a long-term, responsible and sustainable future*
- *To ensure that built form outcomes demonstrate the use of contemporary architecture combined with innovative urban design and building techniques that incorporate ecologically sustainable design principles*

3.5.2 Local Planning Policy Framework

Clause 22.13 – Doncaster Hill Activity Centre Sustainability Management Plan Policy

Designed to implement the objectives of the Municipal Strategic Statement with regard to the Activity Centre, it sets out the requirement for the preparation of a Sustainability Management Plan. It also emphasises the importance of this tool for documenting and realising sustainability outcomes, and relates directly to the Doncaster Hill Sustainability Guidelines.

3.5.3 Zoning

Comprehensive Development Zone Schedule 1 (CDZ1)

The purpose of the Comprehensive Development Zone (CDZ) is to *'provide for a range of issues and the development of land in accordance with a comprehensive development plan incorporated in this scheme'*. Schedule 1 to the CDZ relates specifically to the Doncaster Hill Development Plan, and relevant points of purpose include:

- *To provide for a vibrant range of mixed uses that support the strategic role of Doncaster Hill Activity Centre*
- *To provide for use of land that is consistent with the Doncaster Hill Comprehensive Development Plan, September 2004*

The Doncaster Hill Comprehensive Development Plan, September 2004, an incorporated document of the Manningham Planning Scheme, was prepared under the requirements of the CDZ, and revised in April 2008. The Plan establishes seven defined precincts and provides land use visions and objectives for each. The Plan encourages increased density, a mix of land uses based on horizontal layering, a critical mass of activity and integrated movement networks.

Amendment C73 to the Manningham Planning Scheme replaced Schedule 1 to the CDZ in December 2007, due to expire on 31 December 2007. Amendment C73 extends the timeframe of Schedule 1 to December 2009, to allow the development of an alternative planning control solution for the Doncaster Hill Principal Activity Centre. Amendment C76, currently on exhibition, seeks to include five additional parcels of land within the CDZ1.

3.5.4 Overlays

Clause 43.02 – Design and Development Overlay, Schedule 6 (ddo6)

The purpose of the Design and Development Overlay (DDO) is to '*identify areas which are affected by specific requirements relating to the design and built form of the new development*'. Schedule 6 to the DDO relates to the Doncaster Hill Activity Centre, and sets out specific design objectives to be achieved, requirements for height, setbacks, overshadowing, boulevard character, landscape design, advertising signage, and subdivision. Within identified precincts, maximum building height, design element height, and setbacks to front, side and rear walls or buildings are specified to guide development and achieve a positive outcome. Key relevant design objectives include:

- *To provide for high density development supporting the strategic role of the Doncaster Hill Activity Centre as the location for sustainable, contemporary, vibrant mixed use development;*
- *To encourage the use of contemporary architecture combined with innovative urban design and building techniques incorporating ecologically sustainable design principles.*
- *To achieve development providing accessible, safe, attractive and functional private and public open space opportunities, which are well connected and integrated within a permeable urban environment.*
- *To preserve solar access in mid winter to the key boulevards of Doncaster Road and Williamsons Road so as to contribute to a comfortable, pedestrian friendly urban environment.*

3.6 Potential Future Influences

▪ Introduction of Development Assessment Committees and Implementation of Activity Centre Zones

In response an audit, the State Government announced a package of initiatives under the *Melbourne 2030* framework, to address the state's population increase. This included the introduction of Development Assessment Committees to assess development proposals in Principal Activity Centres (including Doncaster Hill), specify Housing Growth Requirements, and implement Activity Centre Zones for Melbourne's 26 Principal Activity Centres to provide councils and developers with greater certainty by having one development zone. The initiative aims to enhance liveability of the city, address housing affordability and cater for the rapidly rising population.

▪ Renewable Energy Plan

The Federal Government recently announced a blueprint for mandatory renewable energy targets, available for discussion, in response to climate change. Under the proposal, existing state and territory plans would be replaced by a single national scheme to source 20 per cent of Australia's power from renewable sources by 2020. This would be achieved by the introduction of an emissions trading scheme.

4 Doncaster Hill's People and Organisations

4.1 Organisations

4.1.1 Manningham City Council

Manningham City Council provides a number of services to the local community. Relevant key functions include:

- **Sustainable Design Taskforce** – advisory body established by Manningham City Council comprising Council appointed members, Council representatives and external, independent advisors (architects, urban designers and environmental consultants).
- **Doncaster Hill Place Management Team** – includes a place manager and development facilitator who are focused on delivering positive outcomes for the Doncaster Hill Strategy.
- **Doncaster Hill Issues Forum** – quarterly forum for community representatives, developers, real estate agents and other interested stakeholders to share information and progress updates on the implementation of the Doncaster Hill Strategy, and raise issues. The forum also provides advice, as required, to other committees with linkages to Doncaster Hill (refer Doncaster Hill Issues Forum Fact Sheet).
- **Doncaster Hill Local Developer Breakfast Forums** – quarterly meetings between Council and local developers /key stakeholders with an interest in Doncaster Hill to facilitate future development on the Hill. The sessions include guest speakers, and seek to promote greater co-operation and connection between developers of different sites, and establish a better working relationship with Council.
- **Carbon Rationing Action Groups** – Manningham residents can come together together to make substantial reductions in their carbon emissions by establishing a CRAG. The groups can be used to collectively purchase technology to reduce emissions (e.g. insulation, grid interactive solar panels). This is a Council initiative.
- **Northern Alliance for Greenhouse Action (NAGA)** – memberships comprises nine northern councils (including Manningham) and the Moreland Energy Foundation Ltd.

4.1.2 Sustainability Victoria

At the first workshop held for the Doncaster Hill Smart Energy Zone, participants suggested Sustainability Victoria's role in Doncaster Hill comprise the following functions:

- Co-ordination of a knowledge base
- Information sharing
- Expansion of the knowledge pool
- 'Champion' of public policy
- Encouraging innovation
- Establishing and communicating benchmarks
- Community vehicle for local and state government and the public and private sectors

There will be future opportunities to make funding submissions to Sustainability Victoria, including the public tender for funding applications anticipated for early October 2008. Sustainability Victoria is undertaking a number of other projects in identified Smart Energy Zones. Public access to information on these projects may assist in Council's and developers' future efforts to undertake sustainability initiatives at Doncaster Hill.

4.1.3 Municipal Association of Victoria

The Municipal Association of Victoria (MAV) is a co-ordinating group representing local government issues. In particular, the MAV co-ordinates the Victorian Local Sustainability Network (VLSN), a partnership between 32 Councils actively involved in local sustainability initiatives, Local Agenda 21, and the ESD advocacy group. These are important networks Manningham can draw knowledge from, and also share information with and further promote sustainability initiatives.

4.2 Manningham Sustainability Programs

Manningham City Council is undertaking or will start a number of programs on sustainable development issues. These include:

- Sustainable Living Challenge – seminar series (November 2007-June 2008) providing practical information and advice on a range of sustainability topics to help the community make choices to save money, enhance health and lifestyle and help the environment at the same time
- Green Business Catalyst – Council initiative aiming to assist environmentally sustainable start up businesses becoming established and profitable in their early stages. This will assist in attracting further sustainable businesses investment within the precinct. The project is still in the early stages
- Newsletters – Council's newsletter *Manningham Matters* informs residents of happenings in the municipality. While Doncaster Hill has its own e-newsletter updating recipients on new developments and approvals, Council works and other matters relating to the development of Doncaster Hill
- Corporate tent at Manningham Spring Festival – providing information directly to the community as part of this annual festival with a variety of opportunities to educate the community
- Fact Sheets – a series of fact sheets focusing on ESD have been prepared for Doncaster Hill. Aimed at developers the fact sheets primarily support the Doncaster Hill Strategy
- Cities for Climate Change Program – Council joined in as one of 580 municipalities' worldwide working towards reducing greenhouse gas emissions and minimising climate change. This included education programs, green plumber accreditation, sustainable schools program, 100 per cent renewable energy powering street lighting, hybrid vehicles, and monitoring Council activities
- Sustainable Homes Program – seven part seminar series (October 2006 to May 2007) educated residents about ways to decrease energy and water use in the home, using products such as AAA shower heads, shower timers, compact fluorescent light globes and water sensitive plants
- Get Climate Wise NOW! – seminar series facilitated by Council aimed at increasing awareness and education about climate change impacts
- Carbon Rationing Action Groups (CRAGs) – Council has established groups to facilitate knowledge sharing amongst residents, carbon accounting and group purchase schemes for products such as photovoltaic arrays and solar hot water systems

5 Smart Energy Zone Program Workshops

Workshops were held on 21 May 2007 and 10 August 2007 (prior to this stage of the project starting) addressing ideas and issues for the Doncaster Hill Smart Energy Zone. This was followed by more focused consultation on 20 May 2008 and 15 July 2008 as part of the preparation of this report.

5.1 Workshop One - 21 May 2007

Identified the following options for the precinct:

Renewable energy

- Macro integrated wind and solar
- Centralised heat generation
- Water reticulation (energy generation from downpipes)
- Solar panels – rooftop and integrated
- Continuous energy opportunities for solar energy and micro-generation
- Energy demand in both the AM and PM

Energy efficiency

- Shared open space
- Increased densities
- Planning for transport – community transport options
- Passive solar building design
- Cross flow ventilation in building design
- Applying standards to individual buildings e.g. double glazing and appliances

These workshops did not address energy demand. This project seeks to build on the previous work undertaken and also address energy demand reduction strategies.

Vision brainstorming

- Showcasing to the community
- Leading energy efficiency
- More with less
- Leading renewable energy generation
- Integrated into the fabric
- Cultural / artistic / aesthetic
- Social sustainability – safe / caring / welcoming
- Community engagement
- Local economy and sustainable business generation
- Living / working opportunities
- Co-operation across the Hill

The Vision:

The establishment of a climate positive development at Doncaster Hill integrating leading sustainability in the built environment and providing a platform for leadership and capacity building in sustainable urban development

Strategic Priorities

- Reduce - reducing energy demand across a range of uses
- Supply – seeking to obtain the remaining power requirements from renewable energy generation

5.2 Workshop Two - 10 August 2007

This workshop sought to start setting the sustainability standards, features and priorities that apply across the Doncaster Hill development. Key outcomes included establishing a common sustainability vision across stakeholder groups, and identifying

key strategic priorities for sustainability at Doncaster Hill, and resources needed to establish a focal point for sustainability on Doncaster Hill.

A comprehensive list of key ideas emerged from this workshop, including:

- Focus on climate positive
- Need for a 'vehicle' to deliver actions
- Funding is a critical component
- Incentives and barriers for renewable energy, sustainable building fabric and transport
- Need stakeholder involvement
- Focus on priority actions, knowledge sharing and indicative commitment
- Harness community interest
- The next phase should focus on the development of a SEZ framework, including an agreed vision and pathway for Doncaster Hill

5.3 Workshop Three – 20 May 2008

Council staff from the economic, water, planning and ESD portfolios, and management attended the workshop, to enable the consultant team to understand what sustainability and finance initiatives were being undertaken by Council, identify opportunities to link the SEZ plan with other Council projects and confirm the directions sought for the SEZ plan.

The key directions confirmed in this workshop:

- Encourage renewable energy generation on the Hill and address mechanisms for achieving this
- Provide short, medium and long term goals with a clear vision and monitoring of the plan
- Create an energy plan providing a strategic framework and vehicle for driving sustainability changes across the Hill
- Provide solutions at both building and precinct scale
- Identify the most effective ways of managing energy demand and supply
- Address the reasons for buying GreenPower versus investing in self sufficient renewable power options
- This project aligns with the water strategy: sewer mining and biomass energy generation. The sustainable transport strategy provides two links: reducing car usage (a key energy user) and car parking accommodation in new development, plus upgrades to the public transport network possibly providing opportunities to integrate renewable energy (e.g. solar photovoltaic) generators into infrastructure
- Encourage Doncaster Hill to become a sustainability hub attracting business, development, visitors and residents supportive of these directions

5.4 Workshop Four – 15 July 2008

Attended by a range of people representing utility companies, research institutes, ESD consultants, local and state government and local developers attended the workshop to test the preliminary ideas and ask focus questions relating to the energy plan's direction. The questions and key outcomes are summarised below:

How high should we aim?

Targets should be ambitious and progressively increased to allow for adaptability, particularly in the plan's early phases. Ideally targets should go beyond zero net emissions to negative carbon emissions. Not all participants agreed with this but it was agreed this vision integrate an objective so developers can achieve a profit and there are incentives to use sustainable energy sources.

How can we reduce demand for energy?

A range of ideas were suggested, including:

- Catalyst and demonstration projects
- Smart metering across the precinct
- Education programs and awareness campaigns
- Marketing, branding and recognition of the precinct as innovative
- Treat Doncaster Hill as its own entity, so energy usage can be tracked
- State funding for use of new technologies, building materials, etc. to encourage the market to embrace these new possibilities
- Doncaster Hill should have its own development authority and encourage collaboration between different developers, companies and agencies to trial new initiatives
- Encourage and support buildings that go beyond minimum compliance and encourage the consideration of appliance efficiency (currently not legislated for in the building regulations)

How do we move to alternative energy sources?

A range of the following techniques were suggested, including:

- Create visible projects relevant to a range of people (i.e. solar PV on lightpoles, traffic lights and bus stops)
- Start with co-generation but encourage a broader range of sources (i.e. solar, wind, biomass)
- Carbon pricing is likely to help shift attitudes about cost issues associated with set up costs
- Facilitate more development to incorporate renewable energy into projects themselves and encourage developers/council to share knowledge about their experiences
- Group purchase of renewables such as solar PV and co-generation
- Encourage big users to install their own renewable energy facilities (i.e. Westfield)
- Use incentives be it monetary discounts or savings
- Partnership projects with energy providers to install a new facility on the Hill as a catalyst project
- Take a centralised approaches to the issue
- Get developers to think about renewable energy early in the project and build it into the brief

What elements should an energy plan include?

- An implementation program
- Details of new technologies
- Address good building design, planning, education, incentives and marketing
- An experimental precinct
- Details of funding and legislative tools – pilot policy
- A periodic review and monitoring program

How do we make this work?

- Council taking a lead role and seeking support from the state and federal governments
- Engage with developers early and work with them to get a win-win to achieve the developer's brief and addresses renewable energy as envisaged by Council
- Engage with residents and businesses
- Create communication linkages via a governing body (not necessarily Council)
- Use design competitions to encourage demonstration projects
- Get the best architects involved and developers who have done it before into the precinct.
- Ongoing forums and action addressing barriers and sharing knowledge

6 Case studies

6.1 Masdar City

- Abu Dhabi – zero carbon, zero waste urban precinct
- Estimated completion 2015
- Development area is 6 million square metres

They use the One Planet Living (OPL), a set of 10 guiding principles of sustainability, proposed in a joint initiative by WWF and Bioregional Development, where everyone lives within their fair share of the Earth's resources. Strategies include waste management, drainage and treatment of water and sewage, and the distribution of energy and power throughout the city.

A large photovoltaic power plant will provide the main source of energy to power the city. A temporary photovoltaic power plant will be installed on site before any building commences. Zero carbon heavy machinery will be used during the construction process. As the city nears completion the photovoltaic panels will be transferred to permanent structures within the city.



There will also be a solar thermal plant using parabolic troughs, working on the principal of concentrating solar power into steam and the waste-to-energy plant. Wind farms will also be included in the land around the city.

Energy will be generated from the city's waste, with organic waste material converted into gas to run an engine that generates electricity. Water demand is also reduced via a process of water desalination to service potable water requirements in homes, treatment of waste water and reuse of this water for toilet flushing and irrigation.

It is expected to be a hub for clean technology companies, and research and development institutions in co-operation with the Massachusetts Institute of Technology.

6.2 South Sydney Green Square Town Centre

The South Sydney Green Square Town Centre project establishes a framework development control plan for the Green Square Town Centre, based on ecologically sustainable development principles.

It sits under the umbrella of the *Environmental Planning and Assessment Act 1979*. This legislative tool has been used to establish and regulate the *South Sydney Local Environmental Plan 1998 (Amendment No 17) – Green Square Town Centre*

The plan's objectives include:

- To deliver environmental planning outcomes and benefits to the public and owners of land within the Green Square Town Centre that are significantly superior to those likely to result from development of the land in accordance with the local environmental planning instruments currently applying to that land
- To establish planning provisions for development of a vibrant town centre with an appropriate mix of land uses, visual interest and a distinctive character that is meaningful to the local community, and informed by the social, cultural and historical values and attributes of Green Square.

6.3 Hepburn Wind Project

As a result of investigations into renewable energy options, the Hepburn Renewable Energy Association (HREA), a group of voluntary members committed to contributing to the



reduction of their greenhouse gas footprint, harnessed and promoted the concept of a community owned and driven wind farm. Subsequently HREA formed a community co-operative, now known as Hepburn Wind, that will own Australia's first community owned wind farm.

The project proposes two modern wind turbines, of two megawatts capacity each, to be positioned within 10 kilometres of Daylesford, located approximately 90 kilometres north west of Melbourne. It is estimated the turbines will produce sufficient energy to supply 2000 homes; the equivalent to nearly all of Daylesford and Hepburn Springs. The HREA is bound by a set of rules specific to its needs. The renewable energy generated by the wind park is expected to be sold to an energy retailer under a Power Purchase Agreement

In February 2007, Hepburn Shire Council approved a planning permit for the proposed wind park, and monitored wind speed data is currently being assessed.

6.4 Greensborough Project

The Greensborough Project involves the redevelopment of land within the Greensborough Principal Activity Centre, as a sustainable urban village. Changes to the planning policy framework of the Banyule Planning Scheme (Amendment C51, approved in September 2007) that provide new guidelines for future development with a strong focus on urban design outcomes and mixed uses within a revitalised activity centre, effectively facilitate this project. It is a significant town centre revitalisation project encompassing the GreenEdge development project, comprising a Regional Aquatic and Leisure Centre, Council offices and community facilities, town square, Greensborough Walk and a retail development. The project also includes a mix of retail and residential precincts, car parking and pedestrian walks.

Based on *Melbourne 2030's* principles, strategy and structure, the Greensborough Project will be showcased as an innovative case study of sustainable urban design and living. The State Government has provided Banyule Council with significant funding for a study to investigate ways in which Greensborough can become the 'greenest' suburb. As part of this study, Banyule Council is working with Sustainability Victoria to ensure elements such as natural light, water saving, greenhouse gas reduction, onsite water treatment, recycling, waste reduction, solar heating and solar power generation will be a high priority. Council is also working with the Department of Infrastructure to achieve improved pedestrian, cycling, public transport and vehicular movements.

6.5 London Climate Change Action Plan

The London Climate Change Plan recognises existing unsustainable practices related to climate change, and the required modifications needed to address environmental issues and achieve set targets via amendments to key national regulations and policy. It proposes a system of carbon pricing, with the aim of creating opportunities for London to host carbon trading markets, invest in green funds and research, develop and finance new innovative zero and low carbon technologies. It states half the reduction targets could be achieved if only two thirds of land owners undertook behavioural changes.

The Mayor's Green Homes Program is a key initiative of the London Climate Change Plan. It includes subsidies, advice and referral services, improvement program for London's social housing stock, and developing training to build skills to install and service energy saving and renewable products and systems.

The Plan supports the approach outlined by Sir Nicholas Stern in his recent review, *The Economics of Climate Change*, for the UK government, and endorses and promotes the following recommendations:

- Establish a carbon price, through tax, trading or regulation
- Support the development of a range of low carbon and high efficiency technologies on an urgent timescale
- Remove barriers to behavioural change, particularly to encourage the take up of opportunities for energy efficiency

6.6 Tindo the solar electric bus

Tindo the solar electric bus is an initiative of Adelaide City Council. It will be a carbon neutral vehicle using energy captured from solar photovoltaic systems installed on the roof of the Adelaide Central Bus Station. It forms part of Adelaide City Council's free connector bus service carrying up to 40 passengers. The technology comprises 11 sodium nickel chloride Zebra batteries that are lightweight and almost maintenance free, benefiting from a long life and minimal impact from external temperatures. The bus has a range of approximately 200 kilometres between charges. There are opportunities to establish similar technologies in a number of other capacities such as bicycles and other motorised vehicles including private vehicles.



6.7 Green Streets – Creating sustainable business precincts

Green Streets is an initiative run by a consultancy focused on sustainable communities and business.

Village Well runs inspiring workshops within, and for, communities including sustainable future visioning, and work with different sectors of the community to embed sustainable practices. This series of talks and workshops share simple tools and easy actions that can help you reduce your business footprint and save money on your running costs. We also go beyond individual business sustainability, to see how businesses, local government and community groups can work together to create sustainable precincts. (http://www.villagewell.org/drupal/index.php?q=our_services_environmental, 2008)

6.8 Thuringowa

An initiative of Thuringowa City Council, the Thuringowa Sustainable Village project aims to accelerate the adoption of sustainable practices - design, construction and occupation of residential and urban development - into the region. The Sustainable Village project is based on triple bottom line sustainability principles. It is proposed the new village will contain approximately 11 new households, one or two new roads, and a public park and pedestrian pathways. A variety of lot sizes, along with a diversity of housing types, will be promoted.

Key characteristics of new dwellings in the Sustainable Village include climate responsive urban design, use of alternative building products and materials, energy and water efficiency (to achieve consumption less than half of the average Queensland household), and features considering future lifestyles (working from home, energy constraints, new technologies). Defined parameters of the urban design of subdivisions will ensure optimum performance in the tropics. a sense of community, safety and vitality, integration of natural and built form, and provide innovative services that also are practicable.

Extensive industry consultation was undertaken to assist the development of the concept and implementation of the Sustainable Village project. This approach allowed the development of networks, and provided a degree of ownership, responsibility and increased capacity of participants to support and deliver sustainable development in the region. (http://previous.thuringowa.qld.gov.au/council/departments/planning/sustainable_village/overview , 2008)

6.9 Bedzed – Beddington Zero Energy Development

BedZED is a zero energy development initiative in Wallington, England (London Borough of Sutton) designed by architect Bill Dunster in partnership with BioRegional, the Peabody Trust and Arup. It comprises up to three storey buildings, 99 homes and 1405 square metres of work space. The development is designed to only use energy from renewable sources generated on site including 777 square metres of solar panels and tree waste fuelling the development's cogeneration plant (downdraught gasifier) to provide district heating and electricity. It is understood the gasifier is not being used yet due to technical implementation problems; though the technology has been used successfully elsewhere.

The building construction is based on passive solar design with triple glazed windows and high thermal efficiency insulation. Recycling of waste and use of low impact materials (i.e. from renewable or recycled sources within 35 miles) further minimises the development's impact. Transport is also a critical factor with private cars being strongly discouraged, however, a car share option is available with electricity provided in parking spaces to charge electric cars.

Specific performance measures for the development include:

- Space heating requirements decreased 88 per cent
- Hot water consumption decreased 57 per cent
- At 3KWh per person per day, electricity usage was 25 per cent less than the UK average with 11 per cent produced from solar panels.
- Mains water consumption decreased 50 per cent (or 67 per cent compared to a power shower household)
- Resident's car mileage was 65 per cent less.
(<http://en.wikipedia.org/wiki/BedZED> , 2008)



6.10 Woking Borough Council, UK

Following initial energy efficiency projects within the council, Woking Borough Council established itself as an energy and environmental services company (ESCo) titled Thamesway Ltd. Thamesway Ltd aimed to deliver sustainable energy solutions through public/private joint ventures in the Woking area and beyond. It is based on distributed generation projects providing the necessary scale, financial return and reinvestment in energy efficiency and renewable energy projects. The company is wholly owned by the council but the structure and legal status as a company allows it to take part in energy services projects in and outside of Woking.

The concept is based on providing energy services with value to the customer and enhancing financial viability of decentralised energy. Thamesway achieved this by retailing heating, cooling and electricity direct to customers for comparative prices as energy retailers. Directly retailing to customers a higher price per unit allows revenue to be used to reinvest in energy efficiency, renewable energy projects and tackling fuel poverty issues (such as housing stock improvements, solar panel plants and retrofitting heating systems for low income families). Costs incurred by this model include capital plant, replacement and maintenance, inflation, consultancy, financing and fuel costs (i.e. for purchase of gas for co-generation plant).



The company can produce up to 5 megawatts electricity output through gas powered combined heat and power (CHP) stations that maximise efficiencies of heat and electricity. The program is extended to the more costly solar photovoltaic arrays. A key innovation of this project was to establish CHP then invest in PV resulting in Thamesway being home to 10 per cent of the UK's solar PV. Distribution is through a 'private wire' small distribution network directly connected to customers.

Other initiatives undertaken by Thamesway include demonstrating leading edge technologies and small scale embedded renewable projects (street lighting and parking meters). Bypassing the costs of connecting to the grid so Thamesway can sell the bulk of its electricity and heating at retail prices, along with the ability to implement large scale projects with finance and expertise from the private sector are among the benefits of the Thamesway setup. Thamesway has also formed alliances with Xergi Ltd to form new companies Xergi Services Ltd and Thamesway Energy Ltd to provide consulting services.

7 Energy Base Case

The Doncaster Hill energy base case comprises analysis of the likely energy demand of different sectors (residential, retail and commercial) as development occurs. This is based on the following projections:

- 4080 new dwellings housing 8,300 residents (refer Figure 5 detailing where development will occur)
- 20,000m² additional commercial floor space
- 10,000m² additional retail floor space (excludes Westfield)
- Community and cultural centre development in Precinct 1

The energy base case outlines how much energy will be required to sustain this level of development based on current energy consumption patterns. From this information analysis of the opportunities to increase energy efficiency and reduce demand are undertaken to project a less carbon intensive energy future for Doncaster Hill.

7.1 Projected Development

The quantum of development anticipated in Doncaster Hill is detailed in Figures 3 and 4 and is based on the following assumptions:

Cost Escalation	4.00% p.a.	Increase in energy price
Gas - GHG Escalation	0.00% p.a.	General improvements of emissions from gas from the grid
Elec - GHG Escalation	-1.00% p.a.	General improvements of emissions from electricity from the grid
Gas - Energy Efficiency	0.00% p.a.	Would account for more efficient appliances (e.g. heating, hot water)
Electricity - Energy Efficiency	0.00% p.a.	Would account for more/less efficient appliances (e.g. computers, TVs, heating, cooling)

Figure 6 – Growth in the Built Environment

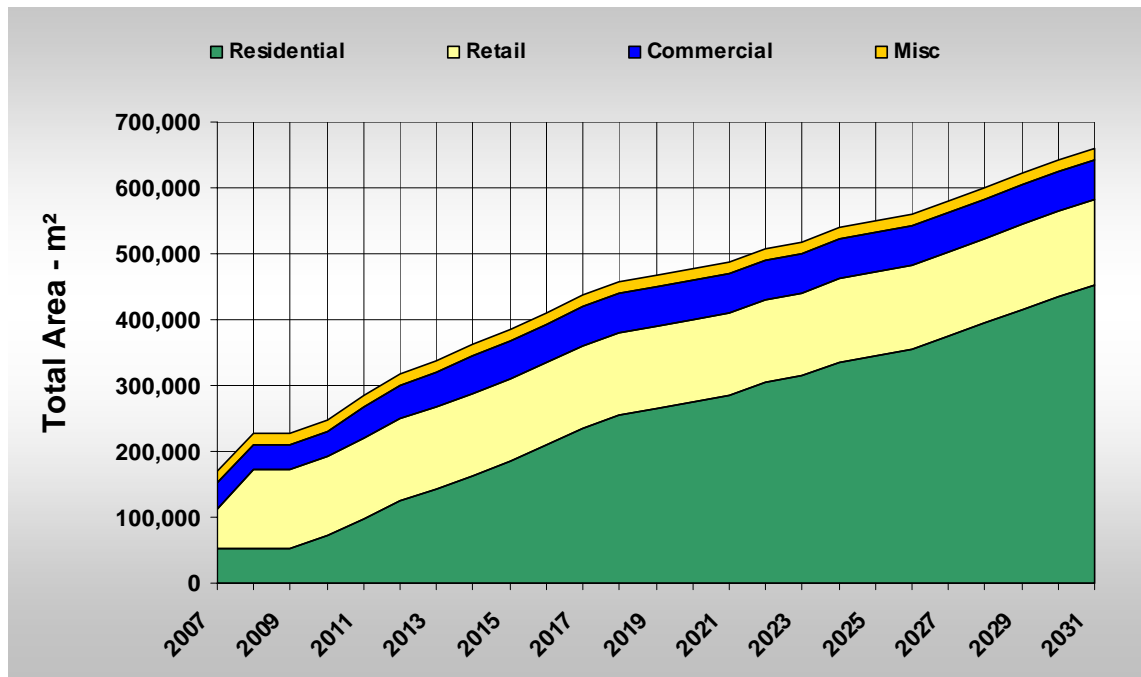
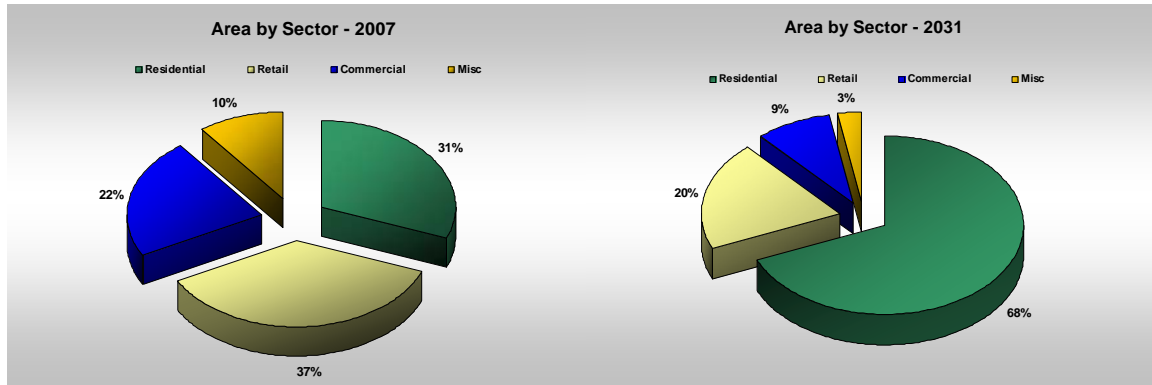


Figure 7 – Comparison of Development 2007-2031 by Sector



Figures 6 and 7 indicate residential development will comprise a significant proportion of the anticipated development in Doncaster Hill. It is noted the miscellaneous category includes community uses.

7.2 How Much Energy will be Required to Sustain Development?

Each sector has been analysed for its energy requirement, breakdown of where energy is used and the greenhouse gas emissions, detailed below.

7.2.1 Residential Sector

Currently the residential sector has a built area of 52,000 m². It is anticipated a very large percentage of the existing stock will be demolished in the coming years. At the same time it is planned to develop 4,000 new households. For the purpose of this study it has been assumed the average size of each household will be 100m²; hence residential buildings will cover approximately 400,000m² by 2031. New dwellings should be the focus of energy efficiency measures particularly as a large proportion of the overall projected development. The main development of new dwellings will start from 2010 and will steadily continue until 2031.

The total energy demand of the residential sector is driven by the significant growth of the built area. In 2007, the total energy use of residential buildings in Doncaster Hill was approximately 26,000 GJ. It is expected this will increase sixfold by 2031; the energy demand will be in the order of 160,000 GJ (refer Figure 8). Three quarters of the energy is supplied by gas (for space heating, hot water and cooking) and a quarter comprises electricity.

Figure 8 – Residential Energy Use (BaU)

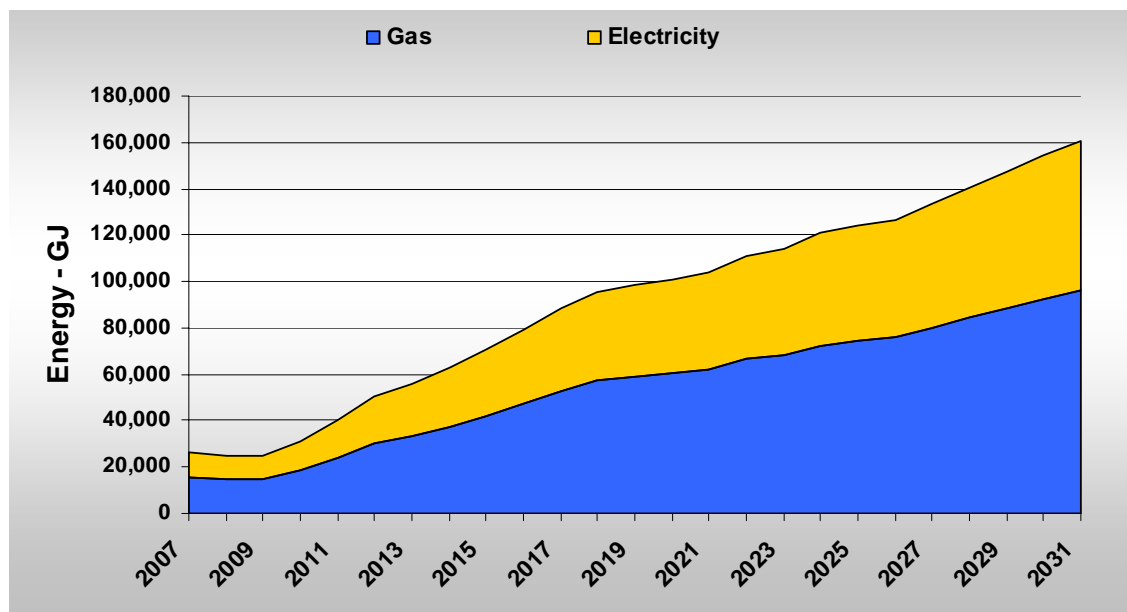
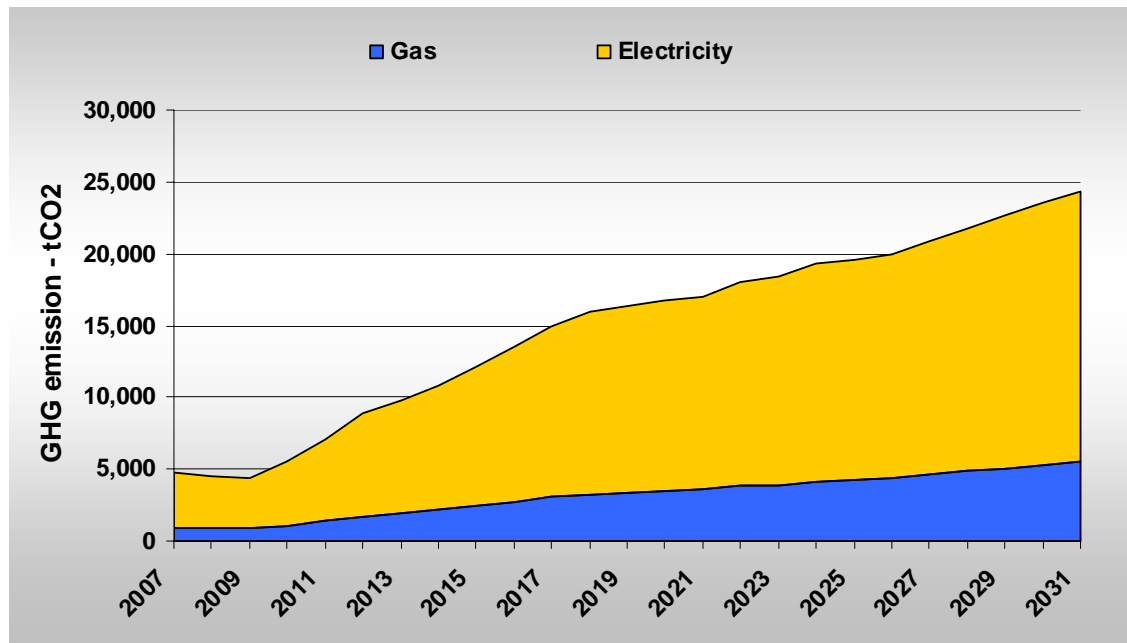


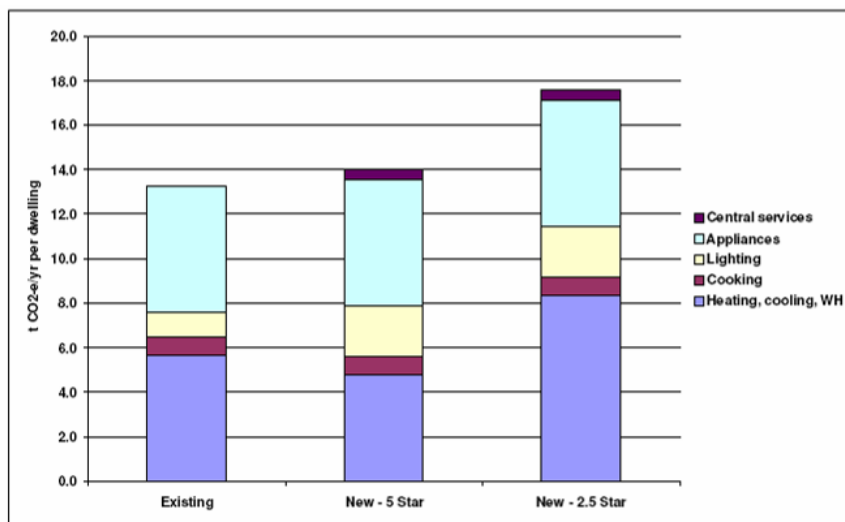
Figure 5 illustrates the associated GHG emissions during the analysed period. The yearly emissions of the existing stock are close to 5,000 TCO₂. In a business as usual (BAU) scenario they will mount to 24,000 TCO₂ by 2031. Even though gas clearly dominates the energy picture, the GHG emissions are mostly related to electricity use a result of the higher GHG coefficient. Emissions by gas contribute only 30 per cent to the total emissions as shown in Figure 9.

Figure 9 – Residential Energy Use GHG Emissions (BaU)



The breakdown of GHG emissions by type of usage is illustrated in Figure 10. The vast majority of GHG emissions are attributed to appliances, space heating / cooling and hot water demand. The following graph (Figure 10) is from the research paper *Options to Reduce Greenhouse Gas Emissions from New Homes in Victoria Through the Building Approval Process* by George Wilkenfeld (April 2007). It compares the difference in emissions following the introduction of the 5 star energy rating requirements for new homes.

Figure 10 – Annual GHG Emissions per Dwelling: Existing, New 5 Star and New 2.5 Star



The modelling assumptions for residential development are as follows:

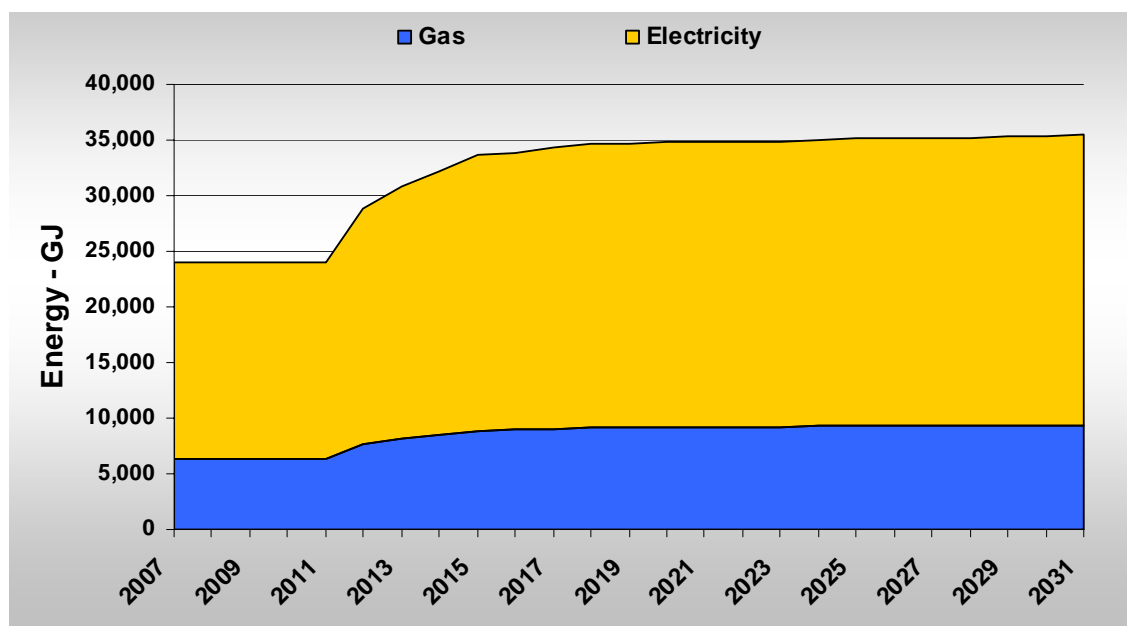
- Existing Stock - Gas Usage 2007: 400 MJ/m²
- Existing Stock – Electricity Usage 2007: 120 MJ/m²
- New Stock – Gas Usage 2007: 320 MJ/m²
- New Stock – Electricity Usage 2007: 96 MJ/m²
- Average Size of New Households: 100m²

7.2.2 Commercial Sector

The built area of the commercial sector in 2007 comprises 38,000m² of floor space. Current plans forecast an increase of 22,000m² by 2031. Based on Council data most new developments will be constructed between 2011 and 2015; the additions afterwards will be minor.

The energy usage of the commercial sector is mostly driven by the existing building stock; approximately 24,000GJ was used in 2007. By 2031 the demand will rise to 36,000GJ per year, a 50 per cent increase. Gas is required for a quarter of the energy demand.

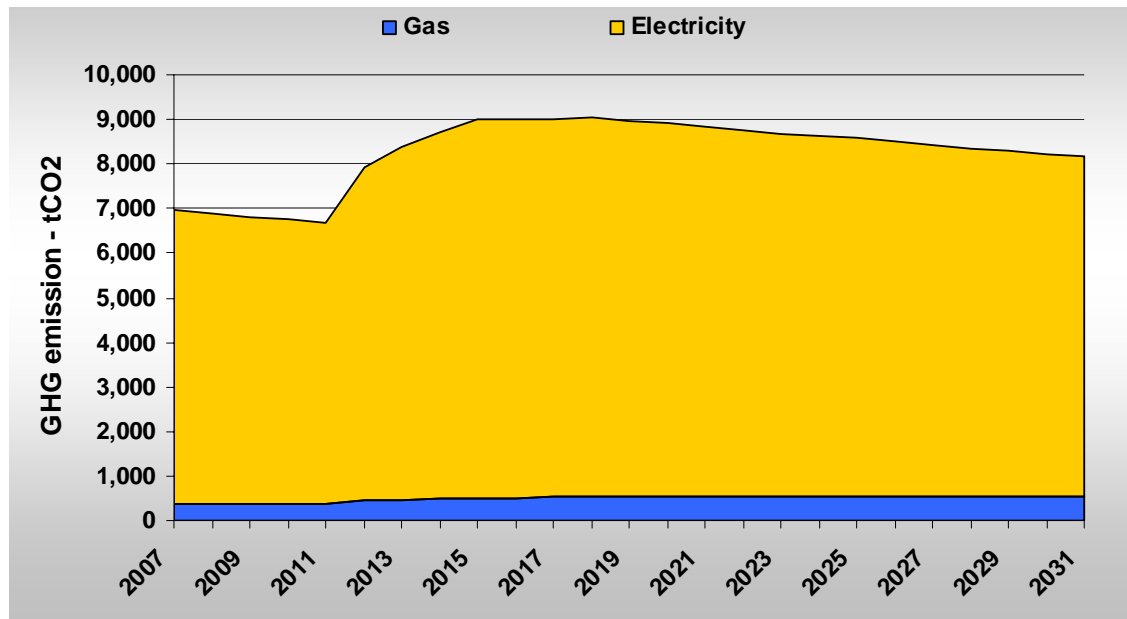
Figure 11 – Commercial Energy Use (BAU)



The increase in GHG emissions in the commercial sector is minor compared to the residential sector, a result of the lower degree of anticipated development and a greater use of gas. The emissions in 2007 have been around 7,000 TCO₂ per year. By 2031 the emissions will rise to 8,000 TCO₂ per year.

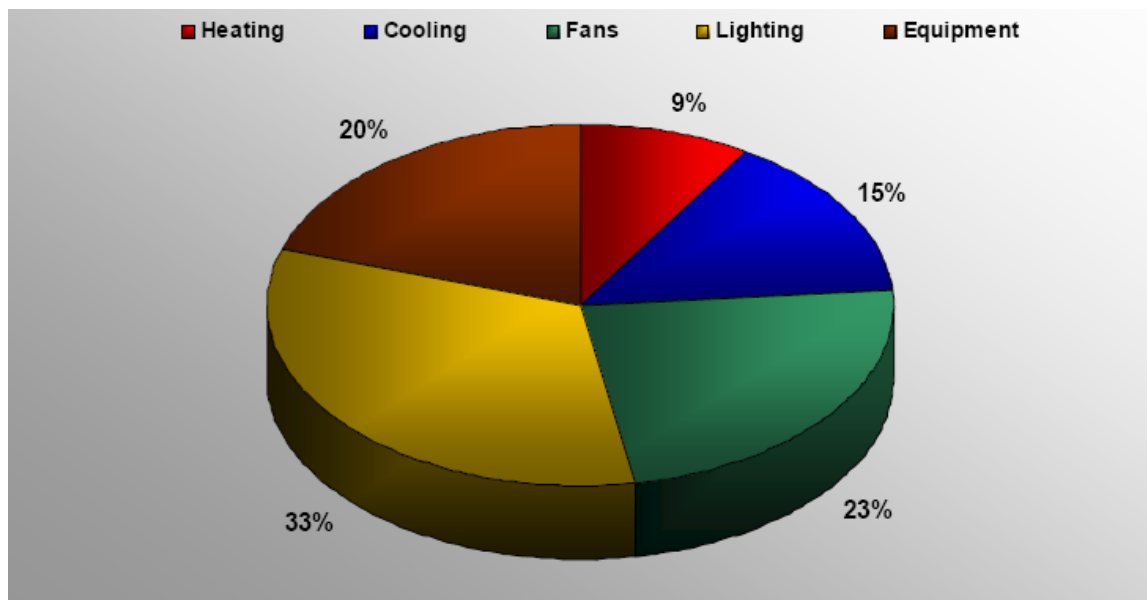
Based on 'cleaner' technologies being used by the industry, it is assumed emissions from the electricity grid are reduced by one per cent. Combined with the steady size of the built commercial area, this decrease leads to a decrease in the overall trend as shown in Figure 12.

Figure 12 – Commercial GHG Emissions (BaU)



The typical energy use within a Melbourne office, based on 2001 benchmarks by the Property Council of Australia, is illustrated in Figure 13. The bulk of the energy is used for heating, cooling and ventilation, comprising about 47 per cent of the total energy usage. Lighting is next largest contributor with 33 per cent of the total energy usage.

Figure 13 – Typical Energy Use in a Melbourne Office (pca 2001)

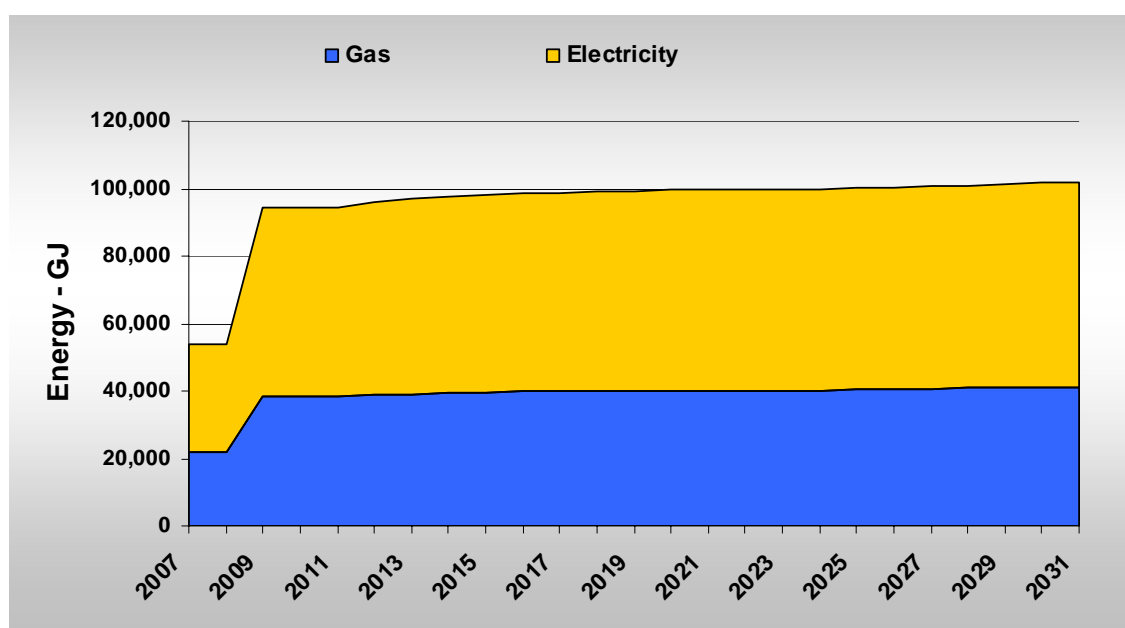


7.2.3 Retail Sector

The built area of the retail sector in 2007 in Doncaster Hill was approximately 62,000m². Most of this area comprises the Westfield Shopping Centre. With the completion of the centre's extension in 2009, the retail sector now comprises close to 120,000m² and the area will grow steadily by 10,000m² to a total of 130,000m² by 2031.

Since the Westfield Shopping Centre represents the bulk of the sector in Doncaster Hill, the energy consumed is mostly related to the centre and its extension. The increase from 2009 to 2031 from other new retail stores is approximately 7,000GJ.

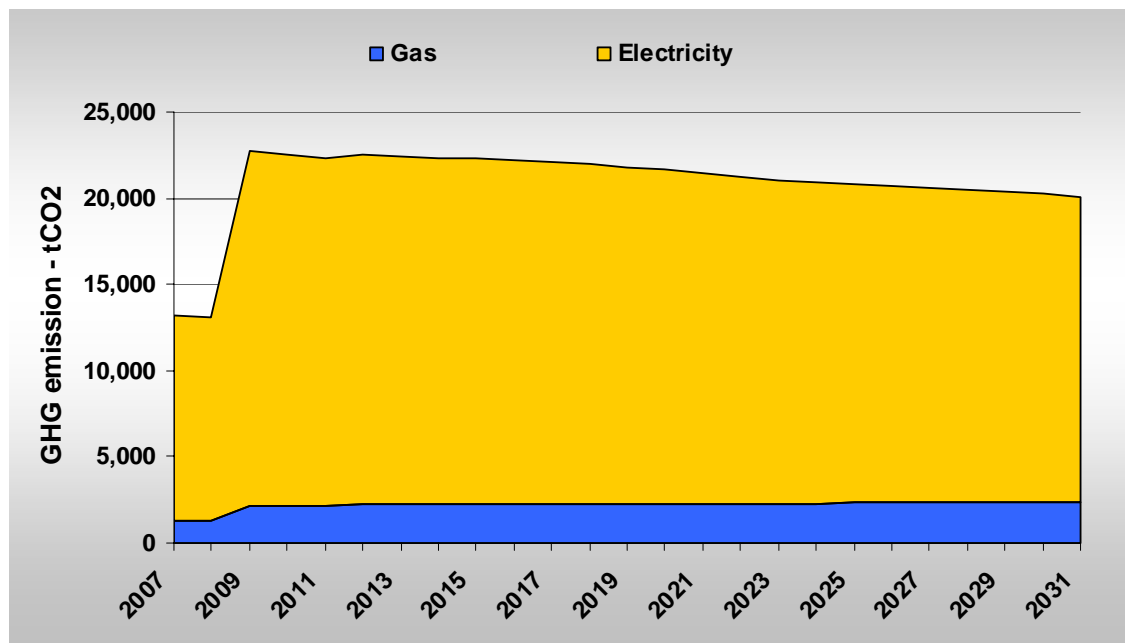
Figure 14 – Retail Energy Use (BAU)



The Westfield Shopping Centre comprises more than 90 per cent of the built area in the retail sector; therefore, the GHG emissions are dominated by its energy use.

Based on 'cleaner' technologies being used by the industry, it is assumed emissions from the electricity grid are reduced by one per cent. Combined with the relatively stable built area this will reduce emissions from 2009.

Figure 15 – Retail Energy Use GHG Emissions (BaU)



Splitting the energy by usage within the retail sector is difficult because the sector comprises very different businesses. However, lighting can be expected to play a dominant role in all retail related developments.

7.3 Doncaster Hill – Overall Forecast

The energy demand in the community will increase threefold from 100,000GJ in 2007 to more than 300,000GJ in 2031.

In 2007 the main energy consumer had been the retail sector, by 2019 the energy in residential buildings will overtake the energy demand for retail to become the most energy intensive sector (refer Figure 16). This increase is vastly driven by the new residential developments, requiring six times more energy in 2031 than today.

Figure 16 – Energy Use by Development Sector (BaU)

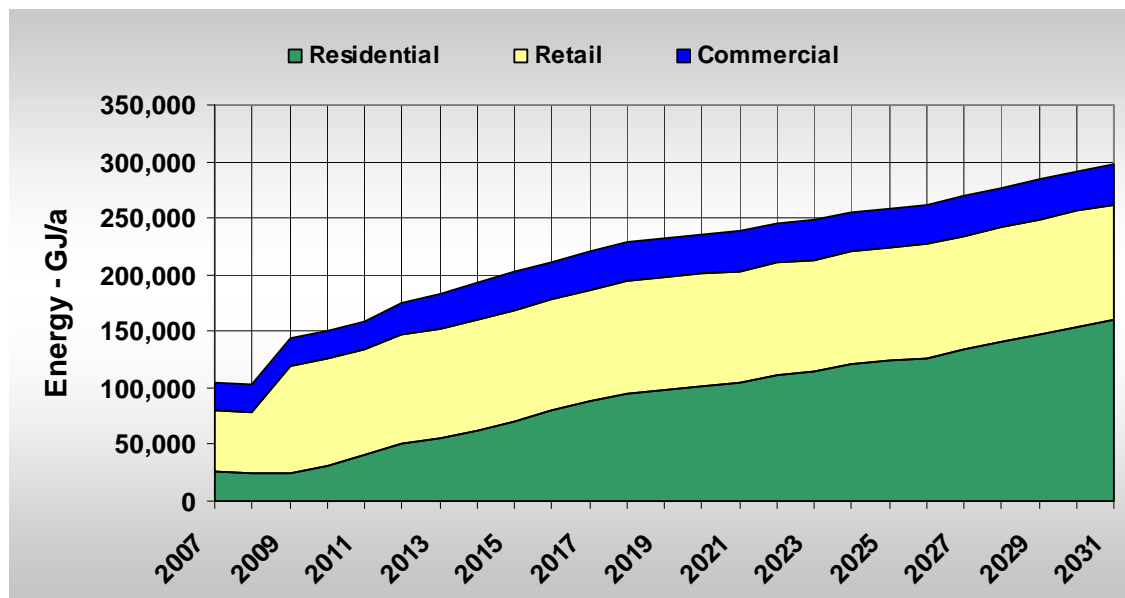


Figure 17 outlines the GHG emissions associated with the projected increase in development. The total emissions in 2007 were approximately 24,000 TCO₂ and will increase to 52,000 TCO₂ by 2031.

The major energy rise is within the residential sector, as discussed in Section 6.2.1 has high gas usage. As gas has a better emissions performance than electricity the increase in GHG emissions is not quite as high as the energy increase. However, the residential sector will overtake the retail sector as the main source of GHG emissions by 2027.

Figure 17 – Total GHG Emissions by Development Sector (BaU)

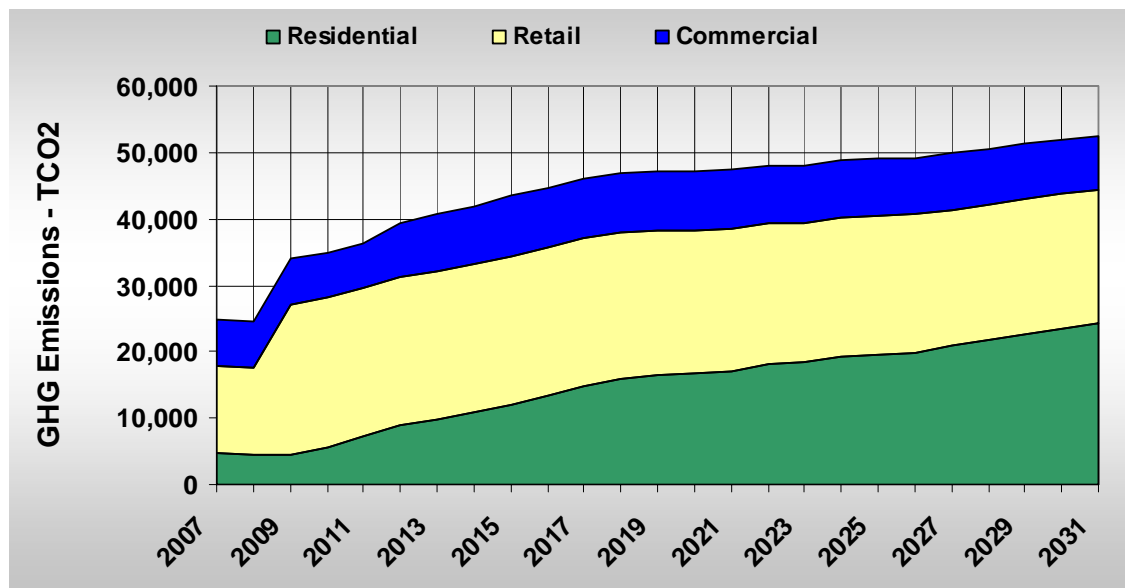
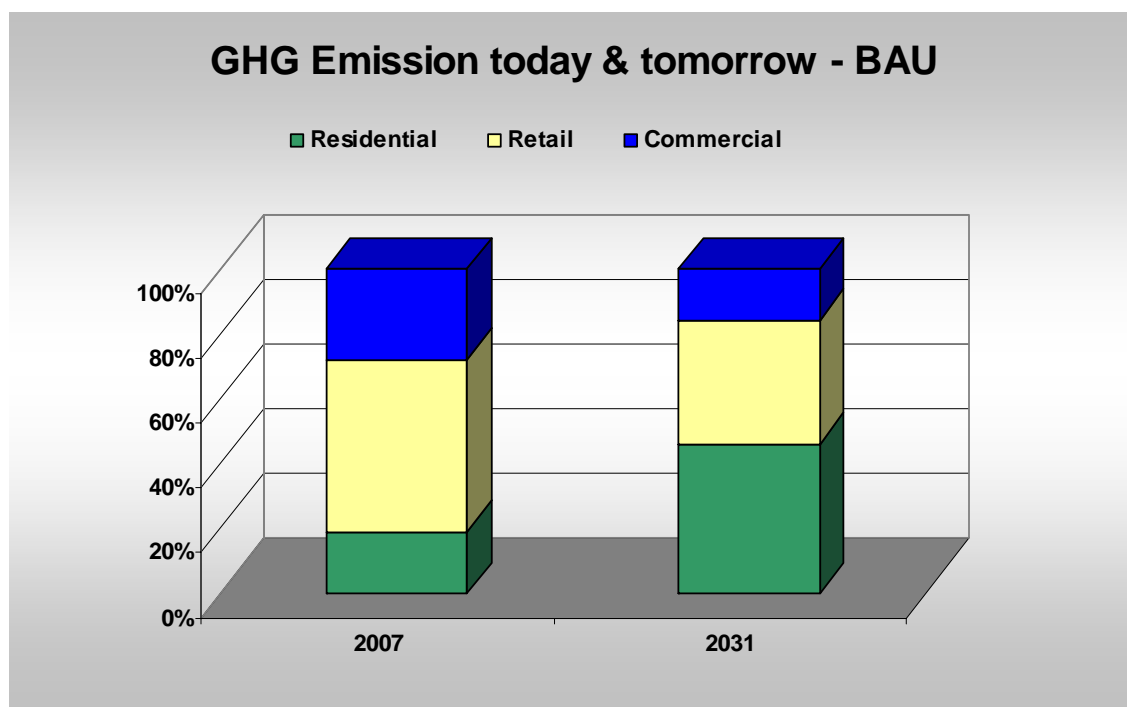


Figure 18 directly compares the GHG emissions of the three sectors in 2007 and 2031. It illustrates the relative impact of the commercial sector reduces significantly over time and future emissions are clearly dominated by the retail and residential sector with the latter being the forerunner due to a greater degree of residential development anticipated in the precinct.

Figure 18 – GHG Emissions Comparison 2007 to 2031



A comparison of the increase in floor space, energy usage requirements and the associated emissions are outlined in Table 1.

Table 1 – Energy Base Case Comparison of Development Sectors

Development Type	Floor Space Increase (m ²)	Energy Requirement per year (GJ)		Carbon Emissions (tonnes)	
		2007	2031	2007	2031
Residential	402,000	27,000	167,000	3,500	18,700
Retail	68,000 ¹	43,100	81,000	7,500	11,800
Commercial	22,500	24,100	35,500	7,000	8,200

¹ This includes the Westfield Shopping Centre extension. Excluding the Centre, the increase is 10,000m².

8 Reducing Energy Demand and Greenhouse Gas Emissions

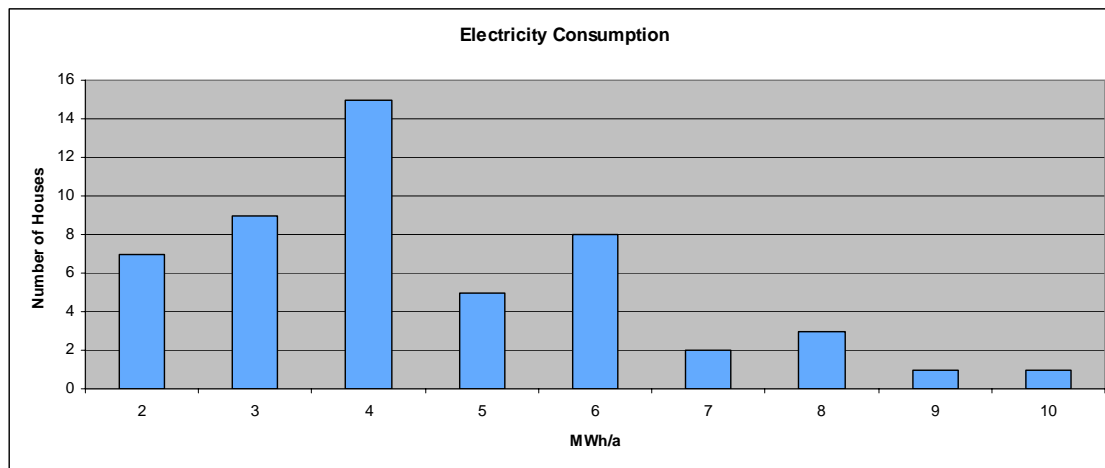
The overall strategy comprises five steps:

1. Improved building design to reduce requirements for heating, cooling, ventilation and lighting
2. Developers select highly efficient heating, lighting, domestic hot water systems and fixed appliances
3. Residents select highly efficient appliances
4. Residents operate equipment to minimise energy consumption
5. Renewable and low carbon energy sources used where practical/economical

8.1 Residential Strategies

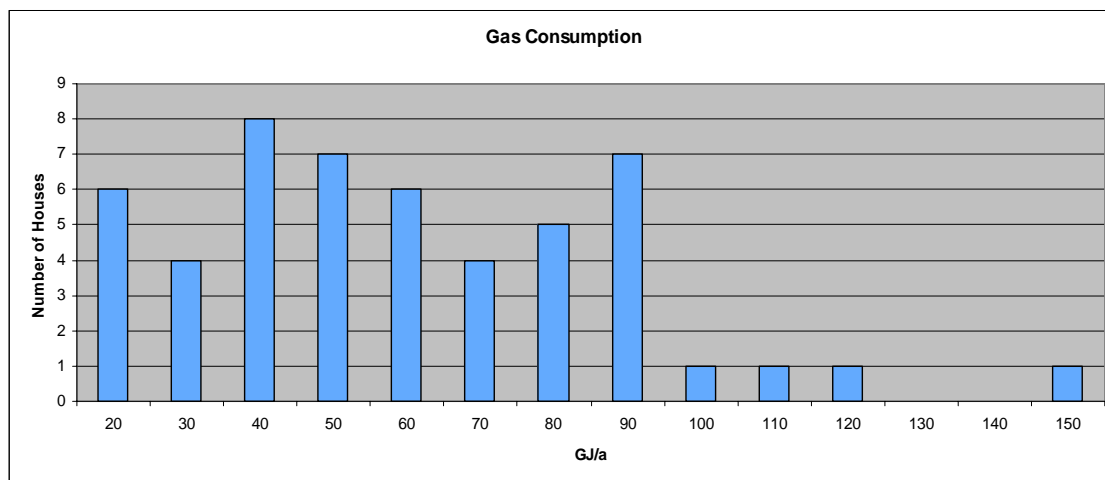
The two graphs below show the distribution of energy consumption across a sample of 51 Melbourne households. The sample covers smaller house sizes ranging from five to 15 squares (equivalent to about 140m²).

Figure 19 – Average Electricity Consumption Comparison²



² Data is taken from *You have the Power – Save Energy*, a study done by Manningham, Maroondah and Boroondara councils. The study analysed the energy consumption of 144 residential households including free standing dwellings (80%) and semi-detached (20%) residences.

Figure 20 – Average Gas Consumption Comparison³



The widespread in consumption detailed in Figure 19 indicates a large influence of occupant behaviour in selecting and operating energy consuming devices. This includes indirect measures such as closing doors, blinds, curtains and hot water taps.

It is suggested a successful campaign to reduce greenhouse gas emissions must address both technology AND education and motivation of residents.

The key strategies for effecting changes in energy efficiency in the residential sector are detailed below.

Lighting

There are three main types of lighting design used in new homes:

- Basic, relying mainly on bayonet or screw fittings, some may be lamped (or eventually, relamped) with CFLs, and possibly also with some linear fluorescents with a lighting load of 9-12 W/m²;
- Premium designs with a large number of dedicated high energy lamps (e.g. LV halogens) and a lighting load of 17-20 W/m²
- Premium designs with a large number of dedicated low energy lamps (e.g. 230V micro-CFLs) and a lighting load of 4-6 W/m².

Strategy: persuade developers to install energy efficient lighting systems (i.e. limit/exclude LV halogen fittings and support low-energy lamps)

Building Rating Tools

Council could make certain ratings mandatory for multi-residential buildings (e.g. the GreenStar multi-residential tool). Alternatively, a custom made rating system similar to Docklands could be developed. These tools could also be used to encourage developers to install more efficient fit out equipment (e.g. lighting).

³ Data is taken from *You have the Power – Save Energy*, a study done by Manningham, Maroondah and Boroondara councils. The study analysed the energy consumption of 144 residential households including free standing dwellings (80%) and semi-detached (20%) residences.

The tools should be open to the public via the internet so they could easily gain recognition. Doncaster Hill residents could use the tools to assess their own home to inspire them to improve their performance.

Solar Neighbourhood

Solar photovoltaic systems could be bought and installed in bulk (i.e. all households in one street decide to buy panels at one time). This could enable residents to access higher rebates from the supplier, reducing the costs associated with installing the panels.

Educational Programs

Energy can often easily be saved by small things like turning the lights off or buying better equipment. Council could increase public awareness through a number of educational programs or highly efficient demonstration homes. Thereby occupants could be informed how to operate their homes in a more energy conscious way, and how to increase comfort and lower their energy bills. Programs could include:

- Sustainability Street
- Climate Rationing Action Group - hold information sessions on easy as well as sophisticated ways to save energy
- Buyers Guide – build a library with recommendations for efficient appliances, PV panels, solar hot water systems and other relevant products

Further Options to Explore

- Residential energy audit program
- Power from waste – methane capture
- Energy efficiency packs (e.g. shower heads, lighting)
- Sustainable design task force
- Website with recommendations on how to save energy

8.1.1 Modelling the Impact

Following is a summary of the assumptions and outputs of a model generated specifically for this project. The energy model has been developed to estimate the likely savings when some of the above strategies are applied. If further GHG emissions reductions are sought then residual energy demand should be met by the use of alternative energy sources.

Table 2 shows the GHG emissions by type in a typical household (based on Wilkenfeld 2007). The strategies described above can be assigned to either improvements in the design, equipment or behaviour. The estimated maximum improvement is shown in the relevant columns.

Table 2 – Residential Energy Improvements Impact Model

	In TCO2/yr	BAU	Design	Equipment	Behaviour	Remainder
Gas	Heating	2.98	0.60	0.60	0.60	1.19
	Hot Water	1.05	0.00	0.25	0.40	0.40
	Total Gas	4.03	0.60	0.85	1.00	1.59
			15%	21%	25%	40%
Electricity	Cooling	0.05	0.05	0.00	0.00	0.00
	Lighting	1.80	0.00	1.30	0.25	0.25
	Cooking	1.35	0.00	0.34	0.34	0.68
	Appliances	4.35	0.00	1.09	1.09	2.18
	Common	4.57	0.00	1.14	1.14	2.29
	Total Electricity	12.12	0.05	3.87	2.82	5.39
			0%	32%	23%	44%
TOTAL		16.15	0.65	4.71	3.81	6.98

The Table below shows the assumed magnitude of penetration for each category.

Improvements Penetration	Design	Equipment	Behaviour
	100%	60%	60%

These Figures are a measure of how strong a certain improvement will influence Council's overall energy performance. Improvements in design, for instance, are independent from user behaviour and are unlikely to be changed by different tenants. Therefore the impact of measures in this category can be fully realised and the magnitude of penetration is estimated to be 100 per cent.

Programs encouraging residents to purchase energy efficient appliances, however, will never reach everyone. Therefore the potential energy savings are reduced. Furthermore, different tenants will have different electrical equipment, adding to a further variance. To account for these impacts it is estimated measures within this category can only unfold 60 per cent of their energy savings potential; the magnitude of penetration.

Measures aspiring to behavioural change are facing similar problems to initiatives within the equipment category. The response of people to behavioural schemes will be subject to a high degree of variability. Furthermore, it should be acknowledged behaviour is a dynamic process that can and will change back and forth. Similar to the previous category, it is estimated the magnitude of penetration will be 60 per cent.

To account for a timeframe, the improvements have been split into initial improvements (e.g. good building design, gradual improvements and behavioural change). The Table below outlines the percentage of improvements used in the energy model.

Initial Improvements	Design	Equipment	Behaviour
Gas	15%	13%	0%
Electricity	0%	8%	0%
Gradual Improvements	Design	Equipment	Behaviour
Gas	0%	0%	25%
Electricity	0%	11%	11%

The assumptions are:

- Initial improvements have been spread across three years.
- Behaviour change has been spread across five years.
- Equipment upgrades (gradual improvements) have been spread across 10 years.

8.1.2 Residential Results – Comparing BaU and the Improved Scenario

The strategies required to achieve the improved energy scenario have been put in the following categories:

- Lighting – Equipment
- Building Rating Tools – Design and Equipment
- Educational Programs - Behaviour

The improved scenario would reduce gas consumption by 35 per cent and electricity consumption by 26 per cent. The average household expenses for energy would be 31 per cent less. The total GHG emissions would be 29 per cent lower. From 2007 to 2031, Doncaster Hill would have reduced its accumulated emissions within the residential sector by a quarter.

Figure 21 – Residential Reduced Energy Use Scenario

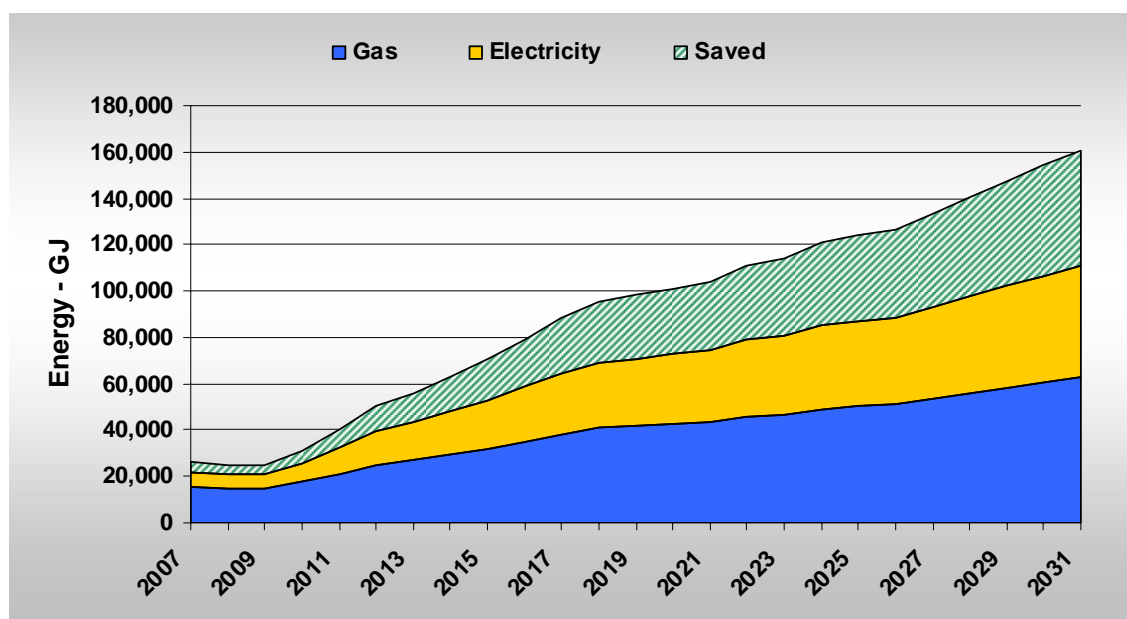
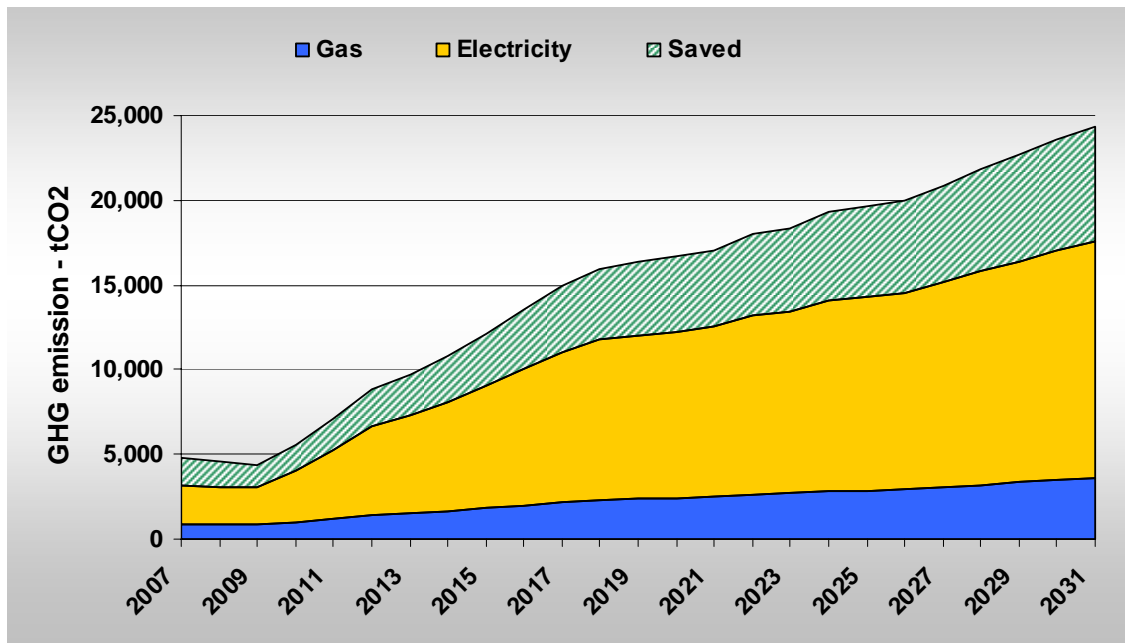


Figure 22 – Residential Reduced GHG Emissions Scenario



8.2 Commercial Strategies

The relative energy consumption of the commercial sector will be reduced in the next 20 years as new developments in Doncaster Hill will mostly be residential. The new commercial buildings will increase the energy demand by roughly 50 per cent, as illustrated in Section 6.2.2. Therefore it is important emphasising not only good practice in new offices but also establishing programs to improve the operation of existing buildings and ensuring likely retrofits are undertaken with an awareness of the building's energy consumption.

Figure 22 illustrates the breakdown in average energy use in Melbourne offices, estimated by the Property Council Australia.

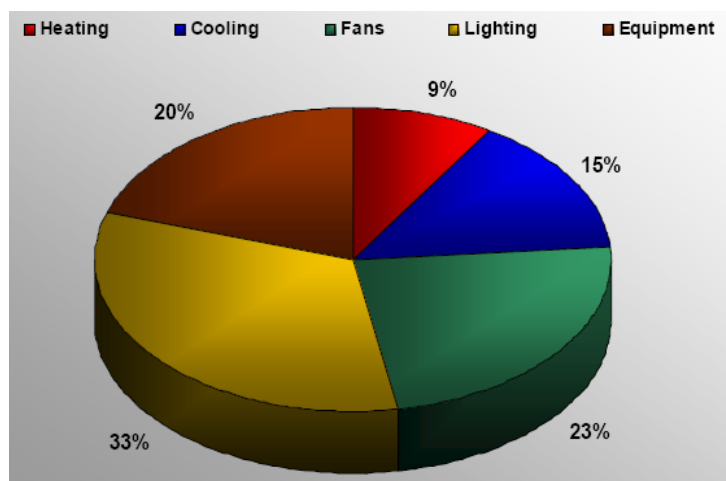


Figure 23 – Energy Consumption in Melbourne Offices (pca, 2001)

The key strategies for effecting changes in energy efficiency in the commercial sector are detailed below.

Improve Building Design and HVAC Systems

The dominant energy consumers are HVAC (heating, cooling and ventilation) and lighting. Good building design can, predominantly, reduce the heating demand by increasing insulation and impact on the cooling demand by choosing highly

efficient equipment. A narrow floor plate could increase access to daylight and provide opportunities for natural ventilation, in turn potentially reducing the energy demand for lighting and fans.

However, tenant behaviour is an important factor in office energy use. Whether tenants and cleaners turn off equipment and lights can significantly change the building's energy performance and associated costs.

Building Rating Tools

Making certain ratings mandatory (e.g. GreenStar Office Tool v3) for building permits, Council could trigger improvements in building design and equipment choice. The tools could also apply when older buildings are being renovated. Similar to Docklands, Manningham City Council could establish its own rating tool outlining the desired ESD requirements for new developments or redevelopments.

Building rating tools can influence many energy related aspects of offices, such as lighting levels, metering requirements and building fabric; thus trigger innovation.

Using Modern Services Technologies

Office buildings can greatly benefit from the use of modern technologies. Nearly half the energy of a typical office is related to thermal comfort. This can be reduced by using highly efficient air-conditioning systems. Co-generation plants can also cater for a large proportion of a building's heating requirements and contribute to electricity needs. Possible connections to the local energy infrastructure could allow companies to sell their surplus heat or electricity to the grid.

Educational Programs

As previously mentioned, offices' actual energy consumption depend, to a notable degree, on the building operation. Educational programs can help inform the building owner and tenants how to reduce their energy consumption, and the related costs and GHG emissions by operating lighting, equipment and HVAC systems in a clever way. The programs could also provide businesses with up to date information on efficient equipment and services, and state-of-the-art building design. The programs could also report on new government rebates for renewable energy systems (e.g. solar hot water, photovoltaic) and GreenPower schemes.

Programs could include:

- How to Reduce Greenhouse Gas Emissions – a take home guide provided at point of sale.
- Staff training in energy efficiency
- Cleaners trained in energy efficiency

Green Business CATA and Chamber of Green Commerce

Council should encourage the establishment of associations for business providing sustainable products and services. These associations could help share knowledge and encourage new business ideas. They could also be a contact point for other companies seeking to improve their efficiency.

Further options:

- Ongoing support for the quarterly Business Breakfast
- Metering and energy consumption reporting
- Council Awards
- Research and reporting of detailed costing and benefit analysis of equipment

8.2.1 Modelling the Impact

The developed energy model had been used to estimate the potential savings. The impact model is built on estimations based on Wilkenfeld's study (2007). If further GHG emissions reductions are sought then residual energy demand should be met by the use of alternative energy sources.

Table 3 shows the assumed magnitude of penetration of each category.

Table 3 – Commercial Energy Improvements Impact Model

Improvements Penetration	Design	Equipment	Behaviour
	100%	60%	60%
Improvements	Design	Equipment	Behaviour
Existing Stock			
Initial	0.0%	0.0%	0.0%
Gradual	0.0%	5.5%	10.3%
Total	0.0%	5.5%	10.3%
New Stock			
Initial	8.3%	2.8%	0.0%
Gradual	0.0%	2.8%	10.3%
Total	8.3%	5.5%	10.3%

These figures are a measure of how strong a certain improvement will influence Council's overall energy performance. Improvements in design, for instance, are independent from user behaviour and are unlikely to be changed by different tenants. Therefore the impact of measures in this category can be realised and the magnitude of penetration is estimated to be 100 per cent.

Programs encouraging residents to purchase energy efficient appliances, however, will never reach everyone. Therefore the potential energy savings are reduced. Furthermore, different tenants will have different electrical equipment, adding to the variance. To account for these effects it is estimated measures within this category can only unfold 60 per cent of their energy savings potential; the magnitude of penetration.

Measures aspiring to behavioural change are facing similar problems to initiatives within the equipment category. The response of people to behavioural schemes will be subject to a high degree of variability. Furthermore, it should be acknowledged behaviour is a dynamic process changing back and forth. Similar to the previous category, it is estimated the magnitude of penetration will be 60 per cent.

The assumptions are:

- Initial improvements have been spread across three years.
- Behaviour change has been spread across five years.
- Equipment upgrades (gradual improvements) have been spread across 10 years.

8.2.2 Commercial Results – Comparing BaU and the Improved Scenario

The above strategies have been broken down into the following categories:

- Building Rating Tools – Design and Equipment
- Modern Services - Equipment
- Educational Programs - Behaviour

The improved scenario would reduce gas and electricity consumption by 12 per cent. The average expenses for energy and the total GHG emissions would be 12 per cent less. From 2007 to 2031, Doncaster Hill would have reduced its accumulated emissions within the commercial sector by 10 per cent.

Figure 24 – Commercial Reduced Energy Usage Scenario

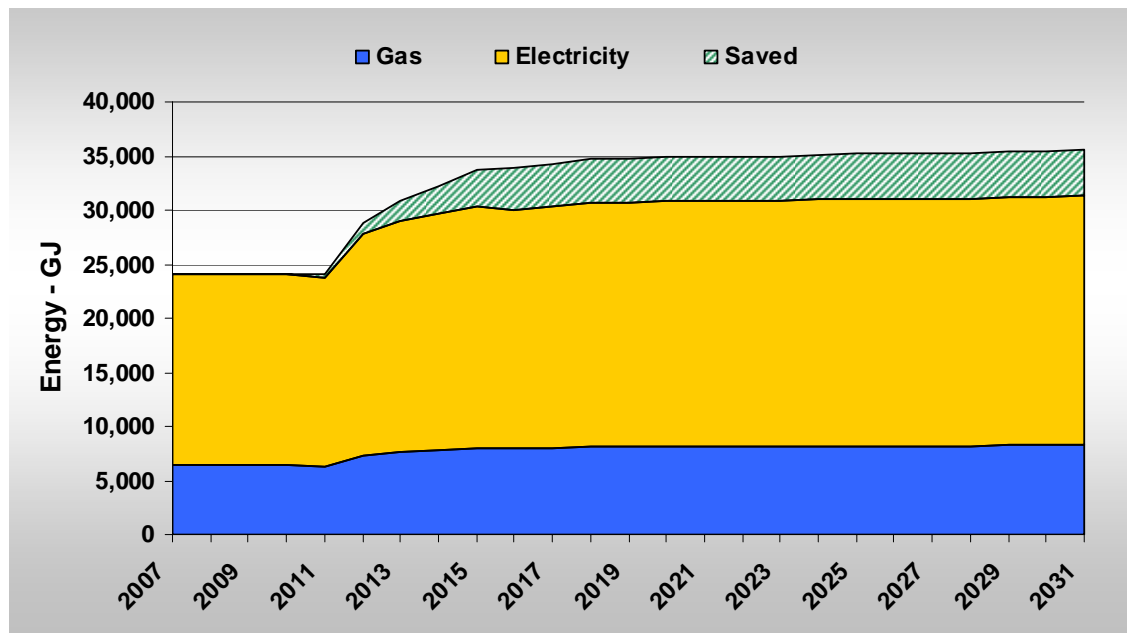
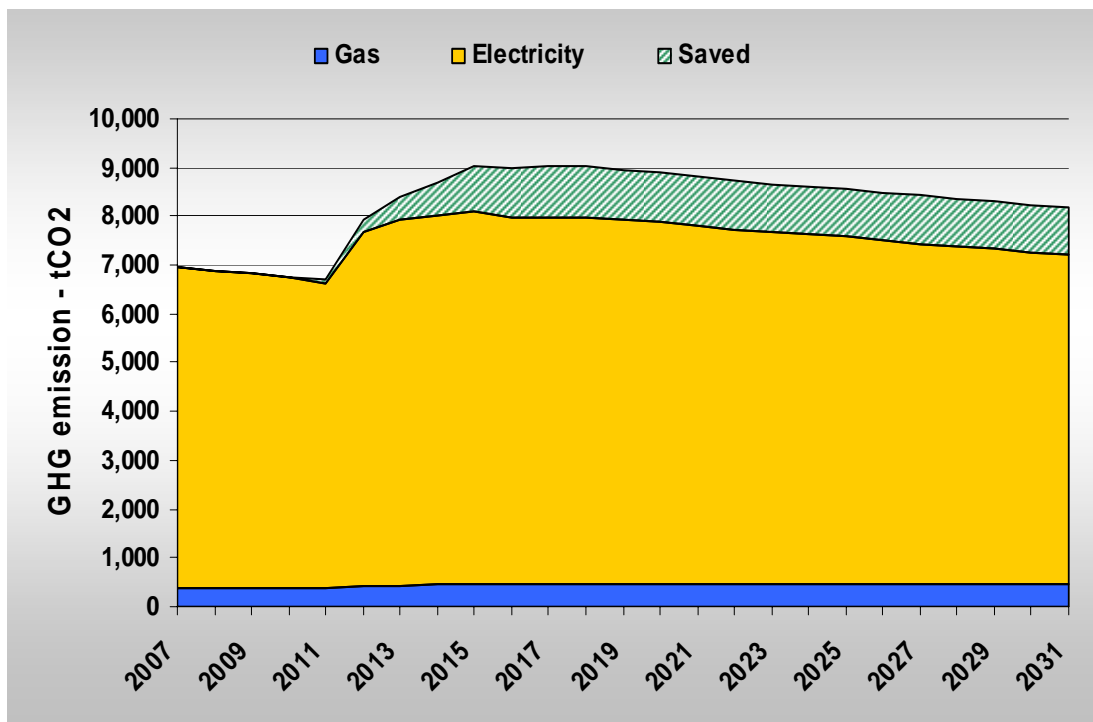


Figure 25 – Commercial Reduced GHG Emissions Scenario



8.2.3 Retail Strategies

The growth of the retail sector is mostly related to the Westfield Shopping Centre extension completed in 2009, with only minor retail developments expected to be undertaken afterwards. Hence Council should focus on improving the current operation of buildings and encourage fit outs and renovation with energy consumption in mind.

The key strategies for effecting changes in energy efficiency in the retail sector include:

Lighting

It is more than likely lighting is one of the key factors in energy use. Building fit out requirements specified by the Manningham City Council could help reduced energy usage. Requirements can be built on existing rating tools and cover the total installed lighting power, and the use of daylight and motion sensors.

Energy Audit

Ninety per cent of the energy requirements for the retail sector are related to the shopping centre. An energy audit of Westfield Shopping Centre could help find potential energy savings. The lessons learnt could be applied to new developments. Energy audits of smaller retail businesses should also be encouraged, however, they may not net the same potential savings. Periodic audits (e.g. annually) should become a key feature of monitoring energy use reduction.

Green Business Precinct

Council could allocate building permits in premium areas to retailers dedicated to saving energy within their business or subscribe to GreenPower. Council should also work towards attracting businesses providing 'green' goods and services.

GreenPower

Westfield Shopping Centre consumes the bulk of the energy. The energy performance could be improved by subscribing to GreenPower. Council could assist in providing information about available schemes.

A different approach to GreenPower would be using the shopping centre's roof for electricity and/or heat generation. This could be a collaborative project between centre management and Council.

Further options

- Free advertising for low energy retailer
- Extensive use of rating tools (e.g. NABERS Retail tool)

8.2.4 Modelling the Impact

The developed energy model had been used to estimate the potential savings. The impact model is built on estimations based on Wilkenfeld's study (2007). If further GHG emissions reductions are sought then residual energy demand should be met by the use of alternative energy sources.

Table 4 shows the assumed magnitude of penetration of each category.

Table 4 – Retail Energy Improvements Impact Model

Improvements Penetration		Design	Equipment	Behaviour
		100%	60%	60%
Improvements		Design	Equipment	Behaviour
Existing Stock				
	Initial	0.0%	0.0%	0.0%
	Gradual	0.0%	5.5%	10.3%
Total		0.0%	5.5%	10.3%
New Stock		Design	Equipment	Behaviour
	Initial	8.3%	2.8%	0.0%
	Gradual	0.0%	2.8%	10.3%
Total		8.3%	5.5%	10.3%

These figures are a measure of how strong a certain improvement will influence the sector's overall energy performance. Improvements in design, for instance, are independent from user behaviour and are unlikely to be changed by different tenants. Therefore the impact of measures in this category can be realised and the magnitude of penetration is estimated to be 100 per cent.

Programs encouraging residents to purchase energy efficient appliances, however, will never reach everyone. Therefore the potential energy savings are reduced. Furthermore, different tenants will have different electrical equipment, adding to the variance. To account for these effects it is estimated measures within this category can only unfold 60 per cent of their energy savings potential; the magnitude of penetration.

Measures aspiring to behavioural change are facing similar problems to initiatives within the equipment category. The response of people to behavioural schemes will be subject to a high degree of variability. Furthermore, it should be acknowledged behaviour is a dynamic process changing back and forth. Similar to the previous category, it is estimated the magnitude of penetration will be 60 per cent.

The assumptions are:

- Initial improvements have been spread across three years.
- Behaviour change has been spread across five years.
- Equipment upgrades (gradual improvements) have been spread across 10 years.

8.2.5 Retail Results – Comparing BaU and the Improved Scenario

The above strategies have been broken down into the following categories:

- Building Rating Tools – Design and Equipment
- Modern Services - Equipment
- Educational Programs - Behaviour

The improved scenario would reduce gas and electricity consumption by eight per cent. The average expenses for energy and the total GHG emissions would be eight per cent less. From 2007 to 2031, Doncaster Hill would have reduced its accumulated emissions within the retail sector by seven per cent.

The consumption of the retail sector is visibly dominated by Westfield Shopping Centre. To achieve further savings, the consumption pattern of the centre would have to be analysed to obtain a clearer picture and reveal enhanced energy saving potentials.

Figure 26 – Retail Reduced Energy Use Scenario

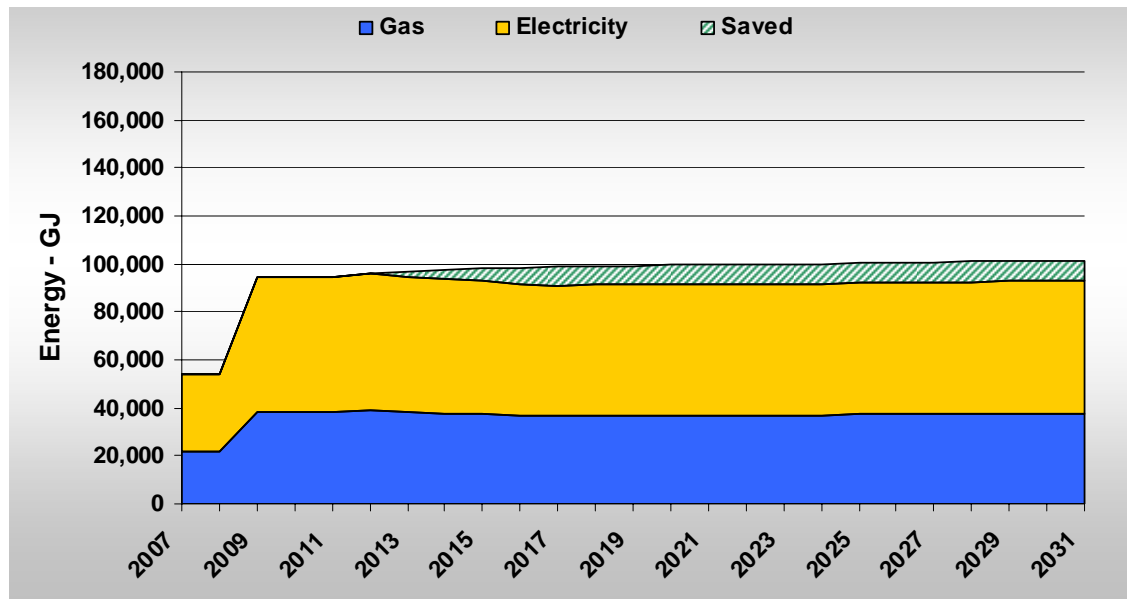
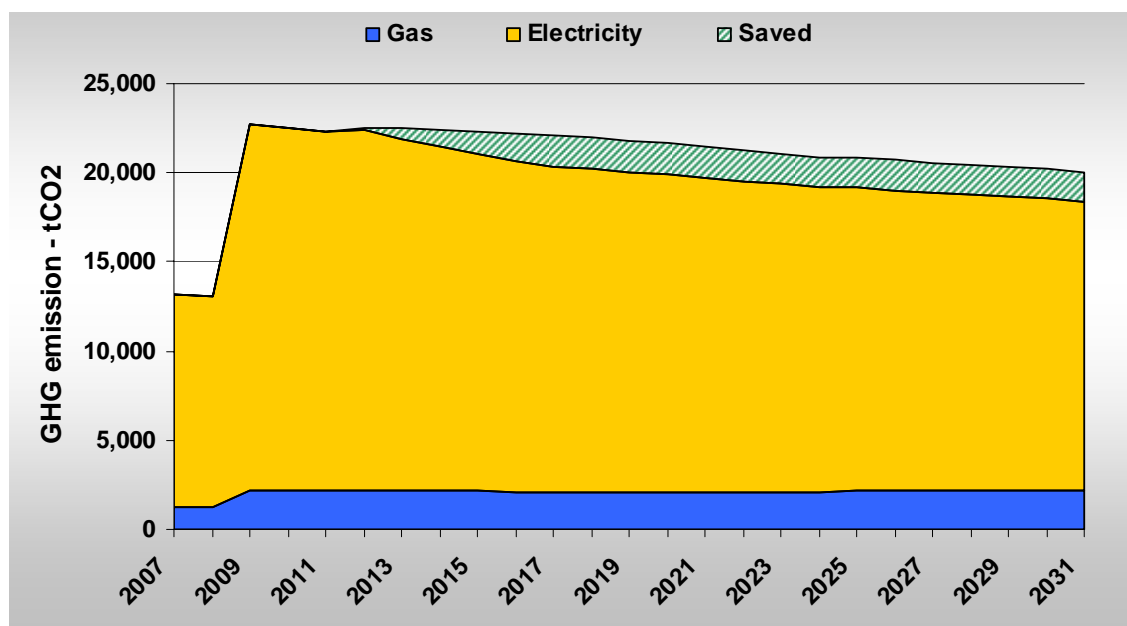


Figure 27 – Retail Reduced GHG Emissions Scenario



8.2.6 Overall Impact

Figures 28 and 29 show the combined savings based on strategies for reducing demand in building fabric, appliances and behaviour within the whole of Doncaster Hill. If further GHG emissions reductions are sought then residual energy demand should be met by the use of alternative energy sources.

Figure 28 – Reduced Energy Usage by Sector

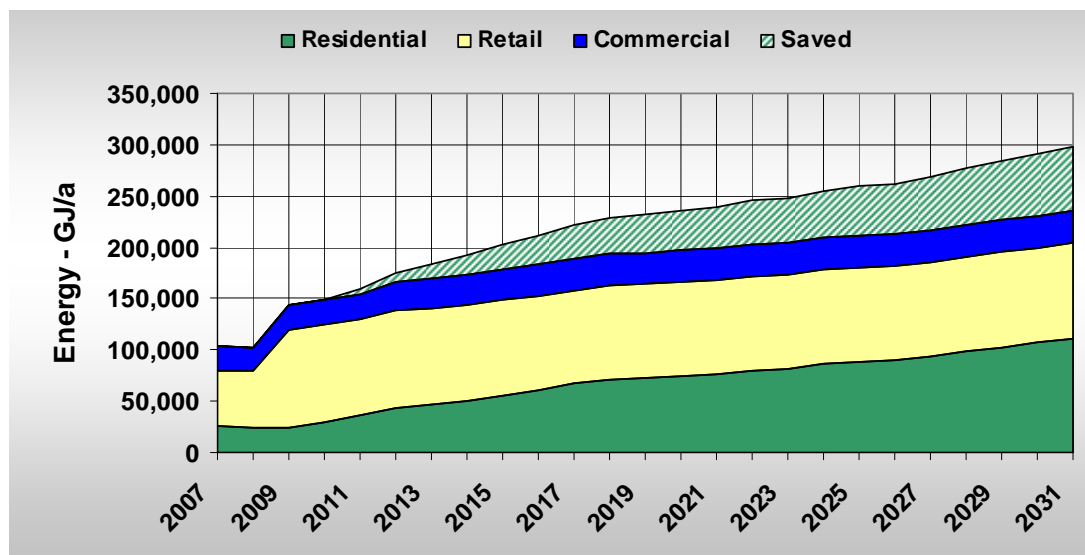
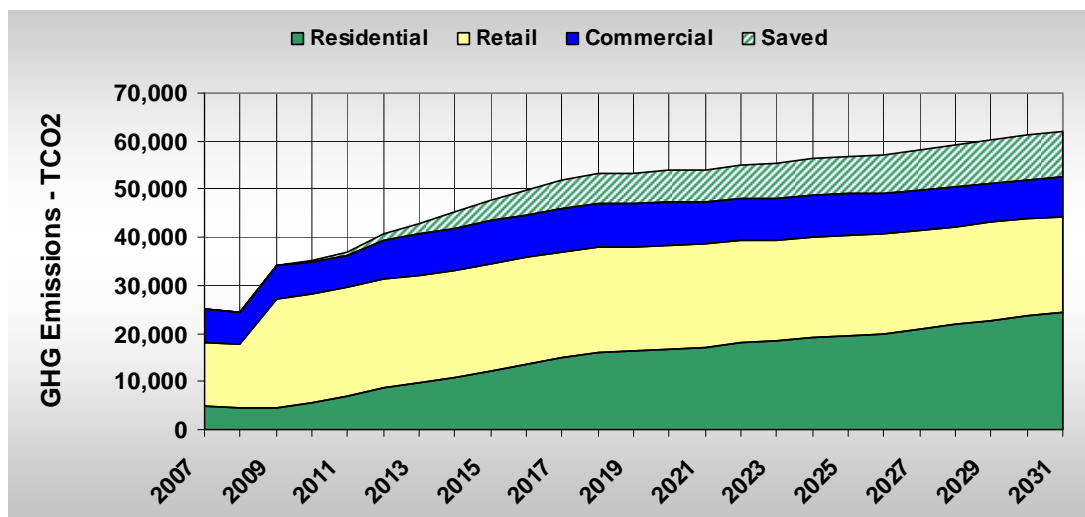


Figure 29 – Reduced GHG Emissions by Sector



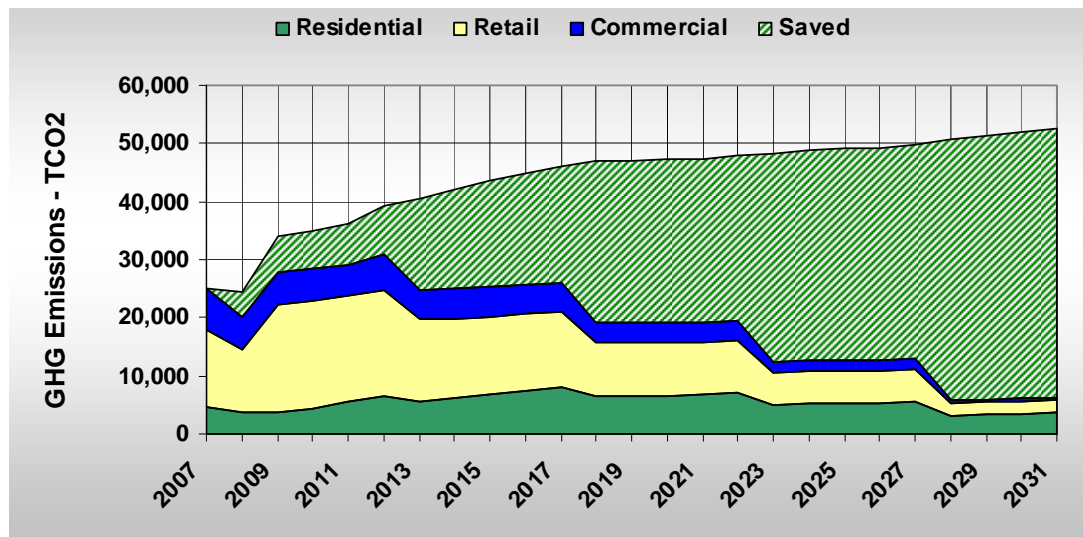
The yearly energy consumption within the improved scenario in 2031 is 21 per cent lower than the BAU scenario. Gas consumption could be reduced by 26 per cent and electricity 16 per cent. This would lead to 18 per cent less GHG emissions per year. The whole energy consumption between 2007 and 2031 would be reduced 15 per cent; equivalent to 12 per cent reduction in GHG emissions. The accumulated energy expenses will be 15 per cent.

8.2.7 Further Reducing Greenhouse Gas Emissions

While the above details ways of reducing demand, there will always be residual demand for energy that will still rely on traditional coal generated power unless renewable sources are used. To obtain substantial reductions in GHG emissions it will be necessary to find other ways to reduce emissions, with the potential to include alternative power sources within Doncaster Hill, using an array of technologies (refer Chapter 8) or the purchase of accredited GreenPower from the electricity grid.

Figure 30 shows that with a combination of reduced demand for energy and incremental increases in alternative energy sources Doncaster Hill can become a zero emissions precinct. Based on the overall greenhouse gas emissions reductions that may be achieved through efficiency improvements to building fabric, building appliances and behaviour, there still is a demand for energy. This demand should be met by a range of alternative or GreenPower options with the aim for Doncaster Hill to reduce its emissions impact to zero by 2031. Figure 30 shows an incremental rise of 20 per cent of all power being sourced from alternative sources every five years.

Figure 30 – Greenhouse Gas Emissions Reduction Based on Use of Renewable Energy Sources



In the future it will be necessary to track the performance of the Doncaster Hill precinct's energy usage against the base case outlined in this chapter. This will be important for understanding if the aims for reducing energy demand are being met and also to understand what needs to be done when implementing renewable energy projects.

Alternative energy options are discussed in Chapters 8, 9 and 10.

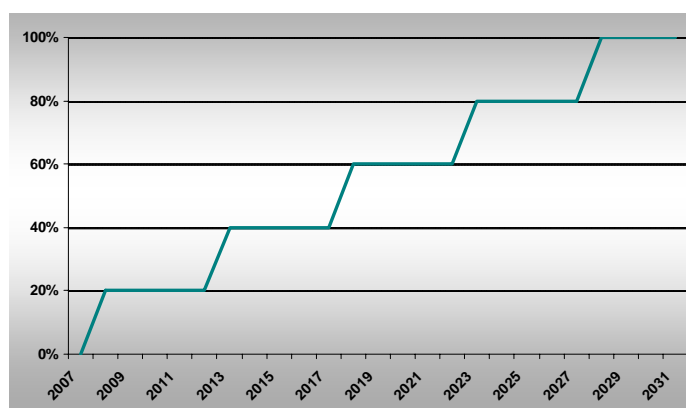


Figure 31 – Renewable Power Requirements 2009-2031

9 Embracing Alternative and Renewable Energy Sources

There are a range of alternative energy technologies with the potential for widespread or decentralised application in the Doncaster Hill area.

9.1 Alternative Energy Sources

A detailed guide to various alternative energy sources is provided in the *Doncaster Hill Sustainability Guidelines*. As such the following analyses the aspects of different technologies available:

- Their applicability to the Doncaster Hill setting and anticipated development types
- Feasibility (cost and benefit)
- Most suitable situations for their installation

9.1.1 Solar Photovoltaic (PV)

Photovoltaic systems (PV) comprise panels producing electricity when the sun shines on them without producing any greenhouse gas. They can be incorporated in the design of new buildings but also be placed on existing buildings. PV systems do not require extensive maintenance and have a fairly long lifespan of 20-30 years. However, the capital costs are high, with typical paybacks of 25-30 years.



Solar PV can be most efficiently applied to building walls and roofs, bus shelters, parking meters and street lighting. There may also be scope to locate solar arrays at ground level, however, this may not be the best use of land in Doncaster Hill and may decrease development consolidation opportunities. Therefore incorporation of solar PV into structures is the key opportunity.

A household PV system of 2.2kW costs \$12,000 after rebates. Council could make PV systems more feasible for Doncaster Hill residents by organising a PV system bulk purchase. This would reduce costs during installation and would make it possible to negotiate better rebates. It would also help residents who do not have a broad knowledge of PV systems to access this technology. A similar program has already been run with great success by Beyond Building Energy (www.beyondbuildingenergy.com). It reduced household demand by 15 per cent.

Implementation:

- Obtain information on the various rebates from state and federal governments
- Liaise with potential local suppliers of PV systems
- Form an action group to inform local residents of the bulk purchase program
- Co-ordinate the demand and purchase of PV systems
- Council demonstration projects on public facilities

9.1.2 Solar Hot Water

Solar hot water systems rely on roof mounted collectors to provide 'free' heat to hot water systems. Solar hot water systems have a short payback (3-5 years) in residential and retail applications where hot water use is high. While there are requirements and incentives for solar hot water use in single dwellings, there is little incentive to include them in multi-residential buildings. A solar hot water system typically costs between \$2,000 and 5,000 per dwelling, with economies of scale for larger dwelling groups.

Implementation:

- A bulk purchase program as described in the PV section is recommended to encourage use in multi-residential buildings and high hot water use retail (e.g. cafes)
- Alternatively, consider mandating the use of solar hot water in multi-residential dwellings

9.1.3 Solar Thermal

Solar thermal applications use solar energy to supply tempered ventilation air to reduce a building's total heating load. The technology is most readily applicable to buildings with large heating loads and high outside air requirements. In the Doncaster Hill project area the retail supermarkets present an ideal opportunity for application of solar thermal heating.



The cost of solar thermal is lower in new buildings when integrated with the façade and costs about \$100/m² for a solar thermal wall. As the tempered air reduces the need for heating, the capital costs of HVAC can be reduced and pay backs are within the vicinity of five years.

Implementation

- Provide information to new retail developments on solar thermal applications.
- Consider opportunities in public buildings spaces to demonstrate use of the technology

9.1.4 Wind

Wind turbines use the kinetic energy of the wind. The types of turbines, horizontal or vertical, also have strong influence on the turbine's efficiency. The horizontal turbines have efficiencies up to 45 per cent and vertical turbines normally have less than 20 per cent.



The efficiency of wind turbines is increased as wind speed increases. Hence, the wind turbines normally need to sit as high as they can above the ground as the height above the ground increases the wind speed increases. However, it should be practical and cost effective. The typical tower domestic wind turbines sits between 10 and 20 meters high.

The good efficient wind turbines also require Clean Wind to operate where the wind is constant from one direction and is not being made turbulent by nearby obstacles. The wind conditions at proposed sites should be monitored for these conditions before a turbine is installed.

According to Australian Wind Energy Association, the average capacity factor for wind turbines is 30 per cent. Hence, in the course of a year the turbine would produce 30 per cent of the amount it could theoretically have produced if it was working flat out throughout the year. For 1 kW wind turbine capacity, the typical annual energy output is 2628 kWh.

A typical 1kW is over \$10,000. A rule of thumb estimate for annual operating expenses is two to three per cent of the initial system cost. Therefore, the typical operational cost for a 1kW wind turbine is \$200 to \$300 annually.

Implementation

- The use of use wind power for the production of electricity could be trialled for public building use
- Building integrated wind turbines for electricity production can be encouraged in development applications

9.1.5 Biomass

Biogas is generated through the breakdown of organic material (biomass) in the absence of air. A significant component of biogas is methane (the same gas as 'natural gas' we use for cooking and heating in homes). Collecting separated organic material and digesting it in the absence of air produces biogas. This has many applications and is already commonly used in Europe and other parts of the world as an energy source. Alternative sources of organic material include sewage.

The use of biogas as a source of energy, with the added benefit of reducing costly and environmentally harmful waste to landfill, could be investigated for Doncaster Hill as a precinct wide compost to energy strategy. Currently no similar uses of this technology in Australia for urban developments exist, but there are several trial facilities in non-urban centres.

Implementation

- Conduct a preliminary feasibility study into the site wide collection of organic waste or sewage for conversion into biogas
- Investigate potential funding partnerships for the trial of such an application (e.g. Sustainability Victoria)

9.1.6 Co and Tri-generation

Centralised power plants have a very low efficiency, particularly due to losses within the grid and wasted heat. The overall efficiency from fuel to power at household is in about 20 per cent.

Microturbines are small gas turbines, similar to those in power plants, where the waste heat is captured for use within the building. They can be as small as 30kW, sufficient to supply electricity and heat to about 10 homes and could be used for decentralised power supply.

Currently co-generation is mainly used in hospitals and hotels, where hot water demand is constant and high. It is expected the costs, currently about \$3,000 per kW installed⁴, will come down further in the near future.

Absorption chillers can also be added to the system to convert the heated water into chilled water. This application is called tri-generation as it produces electricity, hot water and chilled water from gas and is most readily applicable to office buildings with high internal loads and cooling requirements.

A 30kW microturbine could supply electricity for about 10 homes and heat for approximately 400m². The GHG savings from using electricity from natural gas instead from the grid are about 330 tCO₂/yr. Since gas is significantly cheaper than grid electricity, the system would save approximately \$20,000 per year during operation. The operation would require 87,000L of natural gas per year.

Microturbines are a potential application for multi-storey offices, multi-residential or for supplying a number of single family homes. It has also been used to provide district energy in some cities like Woking.



⁴ Soares C, *Microturbines: Applications for Distributed Energy Systems*, Butterworth-Heinemann, 2007

Implementation:

- Council to initiate dialogue with co-generation utility providers to conduct feasibility studies for district electricity and heat supplies. Typically Council would be expected to provide 30 to 50 per cent of the upfront capital in return for ongoing reduced electricity tariffs.
- Feasibility studies for large mixed use buildings would also provide insight into those sites with the greatest potential for co- or tri-generation

9.2 Grid GreenPower

GreenPower can be purchased from the grid. It is accredited through a program set up by State Government agencies and departments across the country. The National GreenPower Accreditation Program sets the rules for GreenPower products and independently audits GreenPower retailers' sales and purchases and generators' operations to make sure they are meeting the accreditation criteria. GreenPower can be sourced from solar, wind, water and biomass but through the accreditation program these sources are required to be new technologies and investment. This is intended to boost investment in renewable energy and offer customers options to limit their greenhouse gas emissions impact. Generally non-accredited products are sourced from renewable energy from old sources established decades ago, such as large hydro-electric projects.

Accreditation ensures energy companies are producing renewable energy of the same standard, making it easier for customers to choose between different renewable energy products. Accreditation also means GreenPower retailers' sales and purchases are audited on an annual basis to ensure you get what you pay for. Retailers are audited to check if they haven't counted their GreenPower purchases towards their mandatory requirements to purchase renewable energy under Mandatory Renewable Energy Target (MRET). This means the customer only pays once for renewable energy. Customers can select from a range of 10, 20, 25, 50, 75 or 100 per cent accredited GreenPower, depending on what is offered by the energy retailer.

Implementation:

- GreenPower is immediately available within Doncaster Hill and its uptake should be encouraged in the short term
- In the long term a renewable energy project for the precinct should seek to supply as much, if not all, energy needs in Doncaster Hill and be strongly encouraged as the main energy source

9.3 Comparison of Renewable Energy Types

The following outlines a comparison of indicative cost implications and the likely payback period expected with each alternative energy sources detailed above. It should be noted accredited GreenPower from the grid does not cost more to connect; however, the cost per kilowatt hour varies between four and eight centres more than non-accredited power. It is not possible to determine the cost per kilowatt hour or the likely physical space requirements for each of the technologies as there are a number of factors influencing these factors (i.e. there are a number of different types of technologies within each of these classifications).

Technology	Installation Cost	Annual Ongoing Cost	How many years it takes for the start up cost to be paid off	Ranking
Solar PVs	\$13,000 per kW	Low	25-30 years	5
Solar Hot Water	\$2,000-5,000 per dwelling	Low	2-5 years	1
Solar Thermal	\$100/m ²	Low	5 years	2
Wind	\$10,000 per kW	Low – Medium	20-25 years	4
Biomass – Waste	~\$4,000-\$10,000 per kW	Medium – High	~15-20 years	6
Co-generation (gas fuelled)	\$3,000 per kW	Medium – High	< 5 years	3

9.4 Gross vs Net Feed-in Tariffs

Where renewable energy facilities are connected back into the grid there are implications on how energy charges are applied. Feed-in tariffs are the premium paid for electricity fed into the grid from sources including home solar power systems. Many countries have a policy on feed-In tariffs. Currently Victoria has a standard feed-in tariff paying the retail rate for any power supply to the electricity grid.

As of 2009 a new premium feed-in tariff of 60 cents per kilowatt hour for any unused electricity will apply (almost four times the standard retail price for electricity). This will apply to small scale household photovoltaic systems up to two kilowatts. The existing standard feed-in tariff will apply to systems up to 100 kilowatts including wind, hydro and biomass. (Source: DPI, Energy in Victoria).

The difference between gross feed-in tariffs and net feed-in tariffs is explained below.

- **Gross feed-in tariffs** are the payment to the system owner for each kilowatt produced
- **Net feed-in tariffs** are the payment to the system owner only for the surplus energy they produce

<http://www.energymatters.com.au/government-rebates/feedintariff.php>

10 Implementation Opportunities

This Chapter addresses implementation opportunities for achieving the objectives and actions of the energy plan. The focus is on organisational options to increase generation of renewable energy within and for the precinct. It also identifies the key legislative and non-legislative actions required to pursue the project vision and the roles different organisations will play. Lastly, the big ideas generated throughout the process have been formulated into a list of priority projects that should form the primary directions and iconic projects necessary to 'get the ball rolling'.

10.1 Distributed Energy – Organisational Options

There are a range of options for establishing renewable energy generators in the Doncaster Hill precinct in line with the specific objectives:

- Individual developers undertake initiatives on their own
- Two or more private developers establish shared renewable energy infrastructure
- Joint venture between Council and an individual developer
- Joint venture between Council and an energy supplier
- Council establishing a renewable energy company and a plant on the Hill or nearby.
- A community co-operative whereby a group of people invest in a project

These options will be discussed in further detail below. It should, however, be noted in many options Council plays a role in instigating or championing the ideas for renewable energy. As such the energy plan relies heavily on Council to be the champion for sustainable and renewable energy in Doncaster Hill. Furthermore, more than one of the options can be achieved in Doncaster Hill and achieving a range of these options will contribute to the energy plan's success.

10.1.1 Option 1 - Individual Developers

With a significant amount of Doncaster Hill expected to be redeveloped at medium to high densities there are significant opportunities for individual developers to embark on their own renewable energy projects. Under the planning scheme they are required to go beyond minimum compliance and seek best practice sustainability techniques in their projects.

There are perceived obstacles to establishing renewable energy projects as part of individual developments, attributable to costs and lack of knowledge or experience; however, with support from Council (i.e. education and networking) the issues are not insurmountable. To better equip Council to encourage applicants to embrace the renewable energy opportunities, particularly in the early stages, Council should be in a position to provide them with specific information about the pros and cons of different renewable energy sources. This may require a further study with a more detailed economic analysis of different options and the energy generated from different sources.

As it is voluntary, this option is reliant on the commitment of applicants. If the plan objectives are not being achieved in this manner then strengthening the planning policy may be required. Currently Clause 22.13 of the Manningham Planning Scheme requires:

- Promotion of the benefits and the business case for applying appropriate alternative energy options for a range of different circumstances
- Promotion and encouragement to incorporate alternative energy installations including photo-voltaic arrays, solar water heaters and grid-interactive power generators into the design of buildings. (clause 21.07)
- Integrating ecologically sustainable development principles and techniques into every facet of the design, construction and operation/occupancy stages of a new development to raise the aspirations of all users, appropriate for a city looking towards a long term, responsible and sustainable future. (clause 21.21)
- As part of the proposal, the preparation of the Sustainability Management Plan that should address the building energy management requirements of:

- The design of the building for energy efficiency (thermal envelope)
- The use of energy saving technologies to further reduce demand
- The use of alternative energy sources, whether provided on-site or through the purchase of 'green energy' (Clause 22.13)

There is a strong policy basis for applicants to embrace renewable energy; however, if developers are not installing their own renewable energy facilities then Council needs to understand the obstacles and assist applicants overcome them.

10.1.2 Option 2 - Multiple Developers

This option allows multiple developers to co-ordinate the establishment of a renewable energy facility servicing all developments in the groups. Similar to Option 1 it is reliant on developers voluntarily undertaking this initiative. Council may provide support (i.e. advising different developers about the opportunities) but ultimately the onus is on the developers to work together and establish it on their own.

This option may present challenges such as its location, the ongoing maintenance and perceived legal barriers. This option could be undertaken so one developer provides the renewable energy facility on their property and sells energy to the other developers (i.e. acting like an energy supplier and retailer).

Alternatively the group could act like a community co-op (i.e. developers buy into the project). This option may require the set up of special legal agreements.

This may not be a popular option with developers who usually seek to minimise project risks and this option could be perceived as risky.

10.1.3 Option 3 – Public Private Partnership

A public private partnership (PPP) would include opportunities for Council to undertake a joint venture with developers or energy companies to establish a joint renewable energy project incorporating investment from Council and relevant stakeholders.

Council could establish a distributed energy facility via PPP through public tender seeking submissions from suppliers to establish a renewable energy facility in Doncaster Hill. Essentially Council would help the energy supplier set up on the Hill. Council does not necessarily have a financial stake in this project; rather they are the instigator to make the project happen.

However, Council may opt to invest some of its own capital into a project co-ordinated with a developer to service Council and the developer's energy needs. There are a number of ways a joint venture with developers can take place, including a mix of provision of land/buildings and capital for a distributed energy facility.

10.1.4 Option 4 – Council Establishes Itself as an Energy Company

An Energy Services Company (ESCo) is based on a model of providing sustainable energy at a similar price to conventional energy sources through the retail of heating, cooling and electricity directly to the customer. Direct retailing allows a higher price to be charged above wholesale price (per unit). An example of this is Woking Borough Council, UK (refer to Section 5.10). This model can effectively be used to set up a micro-grid with electricity, heat or cooling connected directly to the customers rather than going through the mainstream grid. This relies on 'private wire' service provision.

Manningham City Council can engage in business enterprises subject to conforming to the regulations of the energy industry. The challenge is for Council to assemble the capital to invest in such a project. This option provides Council a greater degree of control to advance the plan's objectives and demonstrates Council is leading by example for the rest of the community. It can also enable Council to share its knowledge and experience with other groups or developers interested in setting up a system themselves.

10.1.5 Option 5 – Community Co-Op

This option is reliant on a group of individuals in the community to establish their own renewable energy facility such as a wind farm or photovoltaic array. This could be established as part of a new development in the precinct or it might be a group of community members seeking to set up their own facility and sell the power to others in Doncaster Hill. Examples of this option include the Hepburn Renewable Energy Association's (HREA) wind park (refer Section 5.3).

Council may seek to form part of a not-for-profit organisation or group setting out to build a renewable energy facility like HREA

This option is reliant on private investment via a shared purchasing arrangement or similar. It is unlikely Council would play a big financial role in this option as there are other options (as described above) where Council would have more control over the project. However, Council may facilitate the start up of a community co-op energy project.

10.2 Legislative Options

There are a number of mechanisms and organisation types that may be used to deliver on the use of renewable energy projects within Doncaster Hill, discussed below.

10.2.1 Formalising Smart Energy Zones

At the moment Sustainability Victoria's Smart Energy Zones (SEZ) do not have any statutory weight. They are primarily a government initiative and funding program. Formalising the SEZ via a bill of parliament or other mechanism to be identified in a further study would provide a number of opportunities, including setting up a framework where SEZs apply across Victoria and allowing legislation to be tested. The SEZ program may also be rolled out federally so there are a series of SEZ in different locations across the country. Different legislation can apply to the SEZ to cut through the current legislative constraints, particularly in relation to the building and planning.

10.2.2 Bill of Parliament

Council may seek a special Bill of Parliament to override other legislation and provide the specific mechanisms to achieve the energy plan options. Typically there are five steps required for this to take place:

1. Policy development
2. The draft bill is prepared by parliamentary counsel
3. Review of the bill via the parliamentary process comprising the first reading (no debate allowed), the second reading (where principles are debated), detailed review of the clauses of the bill and the third reading
4. The Bill is approved by the Governor (as the Queen's representative) and then becomes an Act of Parliament
5. Commencement of the new law (Victorian Government, <http://www.parliament.vic.gov.au/law.html> , 2008)

Such a Bill of Parliament may seek to override the *Building Act* with set renewable energy targets, increased building energy ratings, etc. This is a very serious and lengthy process and may in the medium term provide Doncaster Hill with the necessary legislative backing to achieve the energy plan. The focus in seeking new laws for Doncaster Hill should be one part of the equation.

10.2.3 Local Government Act

A special Council committee can be set up under section 86 of the *Local Government Act* to deal with particular issues or to achieve a specific outcome. As such under Section 163 of this Act Council can impose a special rate and charge to fund activities associated with the special committee's purpose. This relies on very clear purposes for the committee and for the charges. Council needs to define the area to be subject to the special rate.

This method could be used for setting up a sustainability centre for Doncaster Hill. This would need to serve a range of purposes including potential developers, businesses, residents, and community facilities. It should provide specialist assistance to these groups to turn their project into best practice sustainable buildings examples.

The advantage of this method is the ability to harness funds to further the objectives of this project and other sustainability initiatives. Politically there may be opposition by those affected by the special rate; however, there will be benefits (i.e. accessing expert assistance, an information hub and a sustainability network).

This method was used to establish the Central Geelong Marketing Committee for the revitalisation of the Geelong Central Activities Area. The special committee and the special rates scheme provided opportunities for marketing and other improvement works specifically to benefit the precinct.

While this opportunity does not lend itself to setting up renewable energy facilities, it may provide the framework for promoting renewable energy and sustainability matters in Doncaster Hill, particularly for 'green' businesses.

Another opportunity under the *Local Government Act* is to introduce a new local law. Doncaster Hill already has a local law that came into effect from 1 July 2008. It arises from the Doncaster Hill Strategy and sets a standard for the visual appearance of poorly maintained properties impacting on the overall amenity of the Doncaster Hill Precinct.

10.2.4 Body Corporate Organisations

A body corporate organisation could be set up for Doncaster Hill like the one established in Dandenong. However, in the case of the Dandenong Transit City, it was set up as a Bill of Parliament via the *Dandenong Development Board Bill 2003* thus it is a statutory authority established by the State Government in October 2003. It is scheduled to expire on 30 June 2010. The key purpose of the Development Board is to facilitate development of Dandenong as a key centre for employment and services for south east Melbourne, encourage cultural and community activities, recommend infrastructure and other works to the Planning Minister, and encourage diverse and affordable housing. The Board has an independent Chairperson and eight members representing:

- City of Greater Dandenong
- Department of Planning and Community Development
- Department of Innovation, Industry and Regional Development
- Department of Transport
- VicUrban
- Local business

Details:

<http://www.dse.vic.gov.au/DSE/nrenpl.nsf/LinkView/48B56B78161B9F99CA2573A1000E647FCB3A095B12F1DCC1CA256D190029AA6B>

10.2.5 What can be done under the *Electricity Industry Act*?

To set up an organisation as an electricity supplier and retailer, a licence needs to be sought first from the Victorian Essential Services Commission, in charge of a number of infrastructure sectors (e.g. energy, water, ports, rail).

Licences can be applied for under Section 18 of the *Electricity Industry Act*. To apply for a licence, the applicant must be any 'legal person' including individuals, partnerships, incorporated associations, trusts and corporations. An unincorporated joint venture cannot apply for a licence or if they are not considered a 'legal person'.

Details:

<http://www.esc.vic.gov.au/public/Energy/Regulation+and+Compliance/Licences/Applying+for+a+licence/Applying+for+a+licence.htm>

Generally the electricity industry is pro competition; therefore, obtaining a licence is subject to demonstrating the financial viability and technical capacity of the venture.

10.2.6 What can be done under the *Planning and Environment Act*?

There are various options available to Council under the *Planning and Environment Act*, and in its Planning Schemes (some are already used). The Planning Scheme is the greatest policy tool available to Council. The Manningham Planning Scheme already has a very good policy basis that requires development to go beyond compliance and seek to achieve best practice in a number of environmental areas, including energy.

Other opportunities are the use of Section 173 Agreements to impose a legal requirement on a property title in relation to any matter deemed appropriate. A Section 173 Agreement requirement is imposed via a planning permit condition and must relate to what the development approval allows. It may be possible to use this tool to impose particular renewable energy requirements on new developments such as enforcing the occupier of land to connect to 100 per cent renewable energy.

There are other means of enforcing development commitments (i.e. the use of planning permit conditions stating specific renewable energy requirements). This, however, is reliant on Council following up and enforcing compliance with such conditions; this can be resource intense for Council. Furthermore, once construction is complete the conditions no longer have effect unless the permit relates to an approval for land use so the permit conditions relating to that use will have an ongoing effect.

The current sustainability policy may be further improved by taking into account the strategies outlined in Chapter 10, including more specific references to building assessment tools and targets.

10.2.7 What can be done under the *Building Act*?

There is little potential to implement actions through the *Building Act* or in the *Building Code of Australia* and *Victorian Building Regulations* as these are determined at the federal and state level. Other mechanisms to possibly allow Council to override the requirements of the *Building Act* and *Building Code of Australia* and *Victorian Building Regulations* include a special bill of parliament or strong policies prepared under the *Planning and Environment Act*.

10.3 Non-legislative options

The key non legislative options available to achieve the SEZ plan are based on education and incentives to encourage and support the increased understanding of energy related issues.

There are a range of non legislative options available to Council to encourage and promote more sustainable energy usage within Doncaster Hill. These can include any of the following:

- Memorandum of Understanding
- Incentives scheme
- Awards programs
- Grants schemes
- Payment for environmental services schemes
- Sustainability/environmental indicators
- Community participation and responsibility schemes
- Green business catalyst
- Sustainability information and resource centre – Knowledge Bank

10.3.1 Memorandum of Understanding

A memorandum of understanding is an agreement between two or more parties. It has no legal standing but demonstrates a commitment between the parties. An MoU would typically be established between two parties such as Council and an owner of a stand alone shopping centre making a commitment to delivery of works (i.e. the recommendations of a structure plan or urban design framework). This may be an opportunity for Council to explore with Westfield or other large organisations where renewable energy facilities could be established or get big energy users make a commitment to source their energy from renewable sources.

10.3.2 Council Specialist Sustainability Facilitator

Much like the development facilitator and place managers employed by Manningham already, an officer dedicated to facilitating sustainable development in the precinct should be employed to be a 'sustainability champion' for the precinct. In their role they would work on attracting green business, engage with developers about renewable energy options and provide expertise in how people can assist in the plan being implemented. An ESD and development specialist would be needed to have an in house expert available for a range of activities.

10.3.3 Sustainability Knowledge Bank

Capturing the wealth of knowledge Council, developers, the community and educational institutions have built up is an important opportunity for Doncaster Hill. This should be consolidated into one place, a resource for the community. It could be given a physical presence on the Hill such as an information centre, or it could be an internet based resource.

10.3.4 Incentive Schemes

Incentive schemes such as financial grants and awards programs can assist in achieving the project objectives. These types of initiatives require financial investment from Council; however, there are opportunities to gain sponsorship from private businesses to help fund these incentives. It is important to offer incentives and rewards for those who are embracing renewable energy opportunities. Incentives are identified in the strategies for each development sector outlined in Chapter 8. However, these initiatives alone will not achieve the plan but they are supportive of behaviour change. Awards categories could include:

- Green business awards
- Green building awards
- Green household awards
- Green knowledge sharing award

10.3.5 Environmental Indicators and Monitoring

Establishing a program of environmental indicators and monitoring is critical to achieve energy efficiency and renewable energy projects. These should be monitored over time to ensure targets are being met and if they are not identify and correct any problems. It is important information is available to the public and there is easy access to this information. The introduction of smart metering on all energy usage across Doncaster Hill should allow for monitoring more easily than present. It is noted, data on Doncaster Hill cannot be isolated from the rest of Doncaster Hill by the energy supplier; however, this should be a priority for the future of this energy plan. Also annual reporting should be undertaken so the community can see how progress is being made.

10.3.6 Community Participation and Responsibility Schemes

Community involvement in achieving the plan is critical. The community includes those who live, work, visit, shop, study or develop in the area. Specific schemes should target these different groups and provide appropriate initiatives to capture their involvement. Council run programs such as 'sustainable living' or 'sustainable working' focusing on changing behaviour, and are undertaken in a number of forums (i.e. free workshops, in house training, web based resources, information add on to other Council services like garbage/recycling). Community participation might also extend to hands on projects similar to Plant a Tree Day and Clean Up Australia Day. Thus, the community is involved in building real projects and seeing the benefits of their involvement.

Through responsibility schemes the community takes part in initiatives like 'sustainable streets' where houses/buildings in a street compete with other streets to win the title of 'most sustainable street'. These types of programs further encourage action on a range of sustainability initiatives and encourage community building. Such schemes can also provide 'demonstration projects' for other community members to learn from.

10.3.7 Green Business Catalyst

A green business catalyst could provide Doncaster Hill with the necessary support for expanding businesses offering 'sustainable' goods and services. A catalyst can accelerate the successful development of new businesses.

Fostering these types of business, particularly new start up ventures, can be beneficial for Council and the businesses themselves as it will contribute to a greater presence of green business on the Hill. Locating such businesses together

enables them to share resources and form a support network. There also may be opportunities to create business linkages with the Sustainability Knowledge Bank (as detailed above).

Appendices

Appendix 1	SEZ Implementation Plan
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Appendix 1: SEZ Implementation Plan

#	Strategy		Program	
	#	Implementation Action	How?	Priority
1	Governance		Smart Energy Zone (SEZ)	
	1.1	Investigate and develop the necessary structures and arrangements - organisational, legislative and non-legislative - driving delivery of SEZ goals and objectives	SEZ	High
	1.2	Investigate and, as appropriate, develop ownership models for distributed energy generation incorporating partnership arrangements with developers and other key stakeholders	SEZ	High
	1.3	Establish Doncaster Hill SEZ Advisory Group	SEZ	High
	1.4	Investigate, develop and evolve a SEZ 'vehicle' for the delivery of the SEZ Action Plan. Identify the stages of evolution of the 'vehicle' and describe the structure and purpose of the vehicle at each stage of evolution	SEZ	Medium
	1.5	Identify priority actions and review annually	SEZ	High
	1.6	Engage stakeholders, focus on priority actions, knowledge sharing and indicative commitment, and harness community interest	SEZ	High
	1.7	Align with other key Doncaster Hill initiatives: MoU with Yarra Valley Water and Melbourne Water via the water strategy (i.e. sewer mining and biomass energy generation), sustainable transport strategy provides two links (reducing car usage - a key energy user - and car parking accommodation within new developments, and upgrades to the public transport network possibly providing opportunities to integrate renewable energy like solar photovoltaic generators into infrastructure, and MoU with Department Community Planning and Development	SEZ	High
	1.8	Investigate Doncaster Hill having its own development authority encouraging collaboration between different developers, companies and agencies to trial new initiatives	SEZ	Medium
2	Leadership and Learning		various	
	2.1	Develop the Civic Precinct into a Smart Energy Zone. The transformed SEZ Civic Precinct would incorporate local sustainable energy generation, micro-grids to share electricity, power and heating between buildings, smart metering, energy efficient building envelope (5 star NABERS or better), building energy management system with intelligent HVAC, energy efficient lighting, open and transparent reporting of energy performance, and ongoing building energy management.	SEZ ASB Operational Performance	High
	2.2	Continually progress the necessary conditions supporting innovation and the emergence of Doncaster Hill as a sustainability laboratory at all levels (i.e. intelligent distributed energy systems, technology, policy, urban planning, legislative arrangements, business, research and education)	SEZ ASB Operational Performance Green Bus	Medium
	2.3	Gain state and federal government support for the designation of Doncaster Hill as an area where regulations may be varied to enable innovative sustainability initiatives to be implemented and trialled	SEZ	Medium
	2.4	Foster the adoption of modern building services technologies (e.g. Building Management Systems, smart HVAC systems, co-generation)	SEZ ASB	Medium
	2.5	Establish a program to encourage reporting and benchmarking of NABERS operational performance for all buildings on Doncaster Hill		Medium
	2.6	Investigate how Smart Meters could be roll-out across Doncaster Hill	SEZ	Medium
	2.7	Consider mandating the use of solar hot water in multi-residential dwellings	SEZ ASB	Medium
	2.8	Consider opportunities in public building spaces to demonstrate use of solar thermal technology	SEZ ASB	Medium
	2.9	Conduct a preliminary feasibility study into the site wide collection of organic waste or sewage for conversion to biogas (anaerobic biodigester)	SEZ ASB	Done
	2.10	Investigate potential funding partnerships for an anaerobic biodigester trial (e.g. Sustainability Victoria)	SEZ ASB	Medium
	2.11	Intelligent distributed energy generation with Council to initiate dialogue with co-generation utility providers to conduct feasibility study for district electricity and heat supply	SEZ	High

Appendix 1: SEZ Implementation Plan

#	Strategy		Program	
	#	Implementation Action	How?	Priority
	2.12	Intelligent distributed energy generation with Council to initiate feasibility studies of large mixed used buildings to provide insight into those sites with the greatest potential for co/tri-generation	SEZ	Low
	2.13	Foster catalyst and demonstration projects	SEZ ASB	Medium
	2.14	Investigate potential for an energy company to purchase surplus energy generated from on site facilities within the precinct, trialling a gross feed-in tariff	SEZ	Medium
	2.15	Give consideration to how all new developments could include an alternative energy generation source(s), or be connected to a micro cell or a precinct based alternative, and how the proportion of a building's energy needs provided by the alternative source(s) to increase over time	SEZ ASB	Medium
	2.16	Existing buildings to install an alternative energy generation source(s), or be connected to a micro cell or a precinct based alternative. The proportion of a building's energy needs provided by the alternative source(s) to increase over time	SEZ ASB	Medium
	2.17	High energy users to install an alternative energy generation source(s), or be connected to a microcell or a precinct based alternative. The proportion of a building's energy needs provided by the alternative source(s) to increase over time	SEZ ASB	Medium
	2.18	Council to lead by example by incorporating alternative energy generation source(s) for buildings within the municipal precinct, or be connected to a microcell or a precinct based alternative. The proportion of a building's energy needs provided by the alternative source(s), to increase over time	SEZ ASB	Medium
	2.19	Council to consider other innovative schemes for alternative / sustainable energy generation within the Doncaster Hill precinct	SEZ	Medium
	2.20	Establish iconic projects with a visible presence in Doncaster Hill and draw attention to the area as a sustainability precinct	SEZ	High
	2.21	Explore use of micro wind turbines for shared purpose (e.g. lighting poles and pennants) as place making iconic projects (e.g. a long island strips along Doncaster Road)	SEZ	High
	2.22	Integrate sustainability features, including some iconic elements into the Intermodal Transport Interchange (bus stop) on Doncaster Road.	SEZ	High
3	Sustainable Building - Design and Construction		Accelerate Sustainable Building (ASB)	
	3.1	In regard to the new Civic Precinct development, Council to demonstrate leadership by building a leading sustainable building	ASB	High
	3.2	Improve building design to reduce requirements for heating, cooling, ventilation and lighting	ASB	High
	3.3	Developers select highly efficient heating, lighting, domestic hot water systems and fixed appliances	ASB	High
	3.4	Building rating tools (e.g. NABERS, GreenStar, MUSIC, LCADesign) incorporated in design, operation and sustainability management plans	ASB	High
	3.5	Investigate opportunities for mini grids providing heating, cooling and power	ASB	Medium
	3.6	Building integrated wind turbines for electricity production to be encouraged in development applications	ASB	Low
	3.7	Encourage and support building developers that go beyond minimum compliance and encourage the consideration of appliance efficiency currently not legislated for in the building regulations	ASB	High
4	Local Economy		Green Business Catalyst (GBC)	
	4.1	Investigate opportunities and barriers to establish a 'green business catalyst'	GBC	High
	4.2	Investigate opportunities and barriers to establish a 'green chamber of commerce' or similar association for businesses providing green products and services	GBC	Low
	4.3	Provide sustainable business education and networking opportunities	GBC	Medium

Appendix 1: SEZ Implementation Plan

#	Strategy		Program	
	#	Implementation Action	How?	Priority
	4.4	Establish Doncaster Hill as a sustainability hub attracting business, development, visitors and residents supportive of these directions	GBC	Medium
5	Place making		Doncaster Hill Strategy (DHS)	
	5.1	Investigate developing a 'Sustainable Building' and 'Sustainable Workplace' recognition program	DHS	Low
	5.2	Ongoing support for Quarterly Breakfast.	DHS	High
	5.3	Investigate the opportunities to establish a Manningham Sustainability Awards program	SEZ GBC	Low
	5.4	Promote and encourage iconic sustainability projects	DHS	High
6	Education and Capacity Building		Get Climatewise Now! (GCN)	
	6.1	Deliver education and awareness programs promoting energy efficient behaviours, and encourage the purchase of energy efficient heating, ventilation, cooling, lighting, equipment, water heating and appliances	GCN	Ongoing
	6.2	Deliver education and awareness programs promoting energy efficient new buildings, retrofits and renovations	GCN	Ongoing
	6.3	Deliver education and awareness programs promoting alternative and renewable energy systems, including GreenPower, co-generation and tri-generation, energy from waste (anaerobic biodigesters), solar hot water systems, solar thermal space heating, photovoltaic arrays and wind power	GCN	Ongoing
	6.4	Deliver education and awareness programs about carbon offsetting	GCN	Ongoing
	6.5	Encourage householders and tenants to monitor and improve the energy performance of their home and workplace	GCN	Ongoing
	6.6	Support the creation of 'solar neighbourhoods' through bulk purchase of sustainable technologies (e.g. photovoltaic arrays, solar hot water systems, insulation)	GCN	Ongoing
	6.7	Provide education and capacity building programs (e.g. Carbon Rationing Action Groups, Get Climatewise Now! Workshops, home energy audits)	GCN	Ongoing
	6.8	Explore establishing a Buyers Guide for sustainable products and services available via the internet	GCN	Low
	6.9	Investigate Sustainable Homes tours and promote them to the community	GCN	Medium
	6.10	Establish Council demonstration projects on public facilities	GCN	High
	6.11	Investigate and assess the opportunities to train staff and cleaners in energy efficient behaviour in the workplace	GCN	Low
	6.12	Investigate opportunities and barriers to implement a Retail and Commercial 'Sustainable Fit Outs' program	GCN	Low
	6.13	Investigate opportunities and barriers to implement an Energy Audit program for local businesses (e.g. Vic1000 or similar)	GCN	Low
	6.14	Investigate delivery of bulk purchase programs of sustainable products to the business and retail sectors	GCN	Medium
	6.15	Provide information to new retail developments on solar thermal applications	ASB	Low
	6.16	Deliver education and awareness programs to people selling and leasing premises in Doncaster Hill so they are fully informed about sustainability in the precinct, and promote the sustainability benefits of high energy efficiency buildings as part of the marking of buildings in the precinct.	GCN	Low
7	Operational Performance		Smart Energy Zone (SEZ)	
	7.1	Establish a program to encourage open and transparent reporting of NABERS operational performance, benchmarking and continuous improvement for tenants, developers, whole buildings and precincts	SEZ	Medium
	7.2	Promote and support active energy and water management, with a focus on Heating Ventilation and Air Conditioning (HVAC) systems	SEZ	Medium

Appendix 1: SEZ Implementation Plan

#	Strategy		Program	
	#	Implementation Action	How?	Priority
	7.3	Progressively set more stringent targets over time for a reduction in total greenhouse gas emissions from all buildings in the Doncaster Hill precinct (existing and new buildings) with the aim of achieving zero net emissions from buildings by 2030	SEZ	Medium
8	Funding		Smart Energy Zone (SEZ)	
	8.1	Investigate potential income raising opportunities through bulk purchase programs (e.g. participation fees, efficiency certificates, renewable energy certificates, carbon trading and offsets)	SEZ	High
	8.2	Investigate opportunities for generating income streams such as energy retailing, consulting services, delivery of state and federal programs, and developer contributions for mini infrastructure projects.	SEZ	Medium
	8.3	Apply for grant funding as appropriate	SEZ	High
	8.4	Explore potential strategic partnerships and develop as appropriate	SEZ	Medium

Appendix 2.1: SEZ Co-ordination and Implementation

Objective

Facilitate the implementation of the Doncaster Hill Smart Energy Zone – Precinct Energy Plan (PEP) to progress the Doncaster Hill vision, SEZ goal and objectives through identified key strategies and programs.

Overview

The SEZ program aims to establish Doncaster Hill as a leading example of decentralised, intelligent, energy systems servicing energy smart communities, living in efficient buildings and using equipment and appliances consuming minimal energy. A Smart Energy Zone includes local energy generation, micro-grids for heating, cooling and power service precincts, smart meters monitoring energy use in increasingly useful ways to allow people to intelligently manage their carbon footprint, tenants who continuously improve their building energy performance against benchmarks, and an innovative local economy providing sustainable products and services.

Major Tasks

The major tasks in this program are to:

1. Progress the establishment of a Doncaster Hill Smart Energy Zone by adopting the following strategies, in particular:
 - * Governance: investigate and develop the necessary structures and arrangements - organisational, legislative and non-legislative - to drive delivery of SEZ goals and objectives
 - * Leadership: establish the necessary conditions supporting innovation and the emergence of Doncaster Hill as a sustainability laboratory at all levels - technology, policy, urban planning, legislative arrangements, business, research and education
 - * Operational Performance: continuous improvement through open and transparent monitoring of actual performance
 - * Funding: attracting ongoing funding through traditional and innovative mechanisms

Also to facilitate the following strategies:

- * Sustainable Building - Design and Construction: promote and foster leading practice
 - * Local Economy: encourage the development of a innovative businesses providing sustainable products and services with plenty of local jobs
 - * Place Making: promote Doncaster Hill as a centre for sustainability
 - * Education and Capacity Building: design and deliver programs that support strong, informed, capable, resilient and willing communities
2. Develop and implement a three year action plan informed by the SEZ Consultation Summary, a summary of findings arising from the consultation process.
 3. As part of the Council Action Plan process, prepare an annual progress report, including a review and update of action plan as necessary

Outcomes/Outputs

- * SEZ Action Plan
- * Communication Plan
- * Annual Progress Report
- * Growing recognition of Doncaster Hill, Civic Precinct and Council as leaders in this field
- * Increased implementation of intelligent distributed energy systems
- * Increased alignment and effective integration between SEZ programs, Council TBL commitments, work programs of service units work programs and service delivery
- * Increased capacity to attract external and internal funding and resources, establish strategic partnerships and develop innovative income streams as appropriate

Appendix 2.1: SEZ Co-ordination and Implementation

Budget

\$38,000 per year for three years

Future and ongoing initiatives including in kind contributions by Council to be further investigated.

Appendix 2.2: Accelerating Sustainable Building

Objective

To further progress the Doncaster Hill vision for sustainable buildings created via an integrated design approach. The buildings created via this process will become the model for healthier, more accessible and ecologically responsive environments, where occupants will collectively enjoy the benefits of living in a sustainable urban village and the upfront investment is substantially returned in the lifecycle of the development. The ultimate goal, while only aspirational at this stage, is to deliver buildings by 2030 with zero greenhouse emissions.

Overview

Buildings account for 40 per cent of total greenhouse emissions when embodied energy in materials and operational energy in the lifetime of building is taken into account. The Doncaster Hill Strategy and the Doncaster Hill SEZ program aim to establish Doncaster Hill as a leading example of sustainable urban environments.

Major Tasks

The major tasks in this program are to:

1. Progress the establishment of a Doncaster Hill as a leading example of sustainable building in all phases from design, construction and operation, refurbishment and demolishing. In particular:
 - * Promote and foster leading design and construction practice, adopting the necessary tools and approaches as they evolve to drive continuous improvement (e.g. Building Information Modelling, NABERS, LCADesign, GreenStar and MUSIC)
 - * Use and evolve the tools and processes supporting the delivery of the Doncaster Hill vision (e.g. Sustainability Management Plans, Local Planning Scheme, SEZ Precinct Energy Plan and Urban Design Taskforce)
 - * Identify and develop strategic partnerships to progress the realisation of the vision and goal
 - * Investigate opportunities to educate and build capacity
 - * Develop a culture of benchmarking and active performance management
2. Develop and implement a three year action plan, that is revised annually and informed by the SEZ Action Plan and SEZ Consultation Summary
3. As part of the Council Action Plan process, prepare an annual progress report, including a review and update of action plan as necessary.

Outcomes/Outputs

- * Improved sustainable building methods and practices
- * Growing reputation of Doncaster Hill as a leading sustainable urban environment
- * Property developers, owners and tenants recognised the benefits
- * Smarter building design, construction and operation
- * Examples of 5 star NABERS energy rated buildings
- * Decreasing greenhouse emissions and energy demand as evidenced by actual performance benchmarking
- * ASB Action Plan
- * Communication Plan
- * Annual Progress Report
- * Increased capacity to attract external and internal funding and resources, establish strategic partnerships and develop innovative income streams as appropriate

Budget

\$42,000 per year for three years.

Future and ongoing initiatives including in kind contributions by Council to be further investigated.

Appendix 2.3: Green Business Catalyst

Objective

Encourage the development, establishment or relocation of innovative businesses providing sustainable products and services with plenty of local jobs to progress the SEZ vision, goal, objectives and strategies.

Overview

Doncaster Hill aims to attract existing and emerging innovation businesses to capture opportunities associated with the greening of the economy. Establishing its identity as a leading example of sustainability and innovation, Doncaster Hill provides the ideal urban environment to nurture adaptation, creativity and prosperity.

Major Tasks

The major tasks in this program are to:

1. Encourage the establishment, relocation and development of innovative businesses providing sustainable products and services that incidentally create local jobs by:
 - * Establishing a 'premium identity' for Doncaster Hill as a location where sustainability focused businesses cluster and congregate
 - * Investigate and identify the necessary conditions supporting green innovation
 - * Encourage existing businesses to focus on sustainability, and to be practically and visibly active in the promotion of sustainability throughout the precinct
 - * Investigate and develop strategic partnerships supporting the growth of an economic green precinct
2. Develop and implement a three year action plan informed by the SEZ Precinct Energy Plan and SEZ Consultation Summary
3. As part of the Council Action Plan process, prepare an annual progress report, including a review and update of action plan as necessary

Outcomes/Outputs

- * Doncaster Hill attracts innovative and green businesses demonstrating ongoing prosperity
- * Strategic relationships and partnerships established to support a Green Business Catalyst
- * Increased local employment opportunities providing increasingly sustainable careers and livelihoods
- * Green Business Catalyst Action Plan
- * Communication Plan
- * Annual Progress Report
- * Increased capacity to attract external and internal funding and resources, establish strategic partnerships and develop innovative income streams as appropriate

Budget

\$30,000 in the first year (seed funding)

Future and ongoing initiatives including in kind contributions by Council to be further investigated.

Appendix 3: Doncaster Hill Smart Energy Zone - Programs and Budgets

#	Strategy		SEZ ref	How?	Budget	Materials and Services Costs	Annual Budget	Time	Unit	Program Status? (new / existing)
1	Governance	Investigate and develop the necessary structures and arrangements - organisational, legislative and non legislative - to drive delivery of SEZ goals and objectives	Chapter 10	SEZ program	\$38,000	Business case	Climate 2020	3 years	EEP	new – SEZ co-ordination and implementation
2	Leadership and Learning	Establish the necessary conditions supporting innovation and the emergence of Doncaster Hill as a sustainability laboratory at all levels - technology, policy, urban planning, legislative arrangements, business, research and education	Chapter 10	SEZ program	SEZ	Business case	Climate 2020	3 years	EEP	New – SEZ co-ordination and implementation
3	Sustainable Building - Design and Construction	Promote and foster leading practice and efficient building envelopes	Chapter 6	ASB program	\$42,000	Business Case	Climate 2020	3 years	Major Projects	Existing – but requires additional resources
4	Local Economy	Encourage the development of innovative businesses providing sustainable products and services with plenty of local jobs	Section 10.3.2 and 10.3.7	Green Business Catalyst	\$30,000	Business Case	EEP Economic Development	1 year	EEP	Existing – but requires additional resources
5	Place Making	Promote Doncaster Hill as a centre for sustainability	Section 10.2	Doncaster Hill Strategy	Existing program	Business Case	Doncaster Hill Strategy	3 years	EEP	Existing
6	Education and Capacity Building	Design and deliver programs supporting strong, informed, capable, resilient and willing communities	Section 10.3	Get ClimateWise Now!	Existing program	Business Case	EEP Environment	3 years	EEP	Existing
7	Operational Performance	Continuous improvement through open and transparent monitoring of actual performance	Section 10.3.5	SEZ Program	SEZ	Business Case	Doncaster Hill Strategy	3 years	EEP	New – SEZ co-ordination and implementation
8	Funding	Attracting ongoing funding through traditional and innovative mechanisms	Chapter 10	SEZ Program	SEZ	Business Case	Climate 2020	3 years	EEP	New – SEZ co-ordination and implementation

Total **\$110,000** First year, \$80,000 years 2 and 3

Appendix 4: Smart Energy Zone Wheel – A Strategic Framework



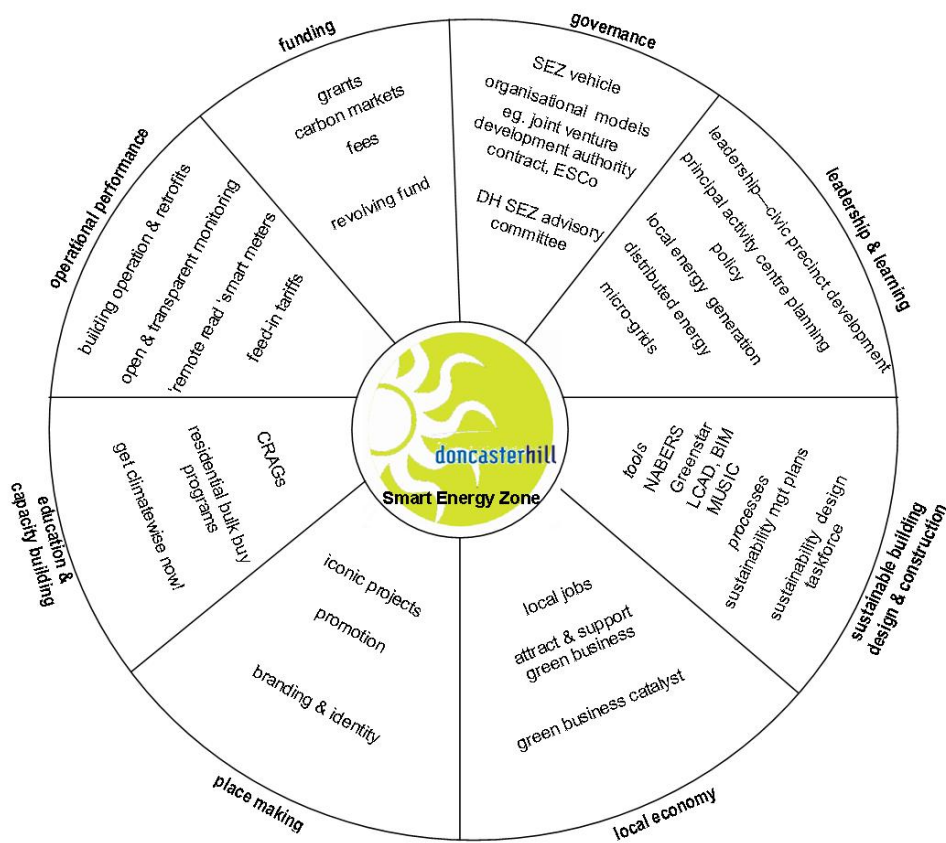
Smart Energy Zone wheel the strategic framework

the vision

Doncaster Hill will become an internationally recognised urban environment which embraces total sustainability in terms of energy, water, transport, built environment and landscape. Living and working in Doncaster Hill people will have improved quality of life as many residents attest to in their account of daily life.

the goal

Significantly reduce greenhouse gas emissions generated from the operation of buildings in the Doncaster Hill precinct and achieve zero net emissions by 2030.



three objectives

reducing energy demand & GHG emissions

embracing local sustainable energy generation

innovation
a sustainability laboratory