

Climate 2020



A climate and energy action plan for a 'climate wise community' by 2020. **Published August 2009.**

The Climate 2020 Action Plan was developed over a period of 18 months with extensive research and consultation with stakeholders, including representatives from community groups, individuals, Council officers, strategic partners and Councillors.

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Contents

Glossary of Terms / Abbreviations	5
The Vision: A Climate Wise Community <i>by 2020</i>	6
1 Introduction and Overview	7
2 Climate 2020 Action Plan: A <i>Strategic Framework</i>	10
3 Community: Climate Wise by 2020	24
4 Leadership: Council Leads the Way	33
5 Doncaster Hill: A <i>Smart Energy Zone</i>	43
6 NAGA: <i>Regional Carbon Mitigation</i>	50
7 Context	56
8 Consultation	62
9 Community - Energy and Greenhouse Profile	67
10 Efficiency	69
11 Decarbonising: Embracing Alternative and Renewable Energy Sources	73
Appendices	81

Figures

Figure 1: Energy losses of centralised energy systems	11
Figure 2: A decentralised energy suburb of the future	12
Figure 3: Pathway to Zero Net Emissions	13
Figure 4: A resident takes advantage of the Solar Homes Bulk Photovoltaic Purchase Program	17
Figure 5: Council Operations: Pathway to a Carbon Neutral Council by 2020	19
Figure 6: Climate 2020 Forecast Council greenhouse profile – Street Lighting, Vehicles and Buildings	20
Figure 7: Climate 2020 Modelling for a Carbon Neutral Council by 2020	20
Figure 8: Necessary Climate 2020 transition of energy use guided by the three objectives	24
Figure 9: Residential Stationary Energy Emissions	25
Figure 10: Trends in Annual Council GHG Emissions and Expenditure	34
Figure 11: Reduced Energy Usage by Sector	44
Figure 12: Reduced GHG Emissions by Sector	45
Figure 13: Greenhouse gas emissions reduction based on use of renewable energy sources	45
Figure 14: Doncaster Hill – Pathway to Zero Emission Buildings	46
Figure 15: NAGA Region	51
Figure 16: Necessary transition of energy / economy systems guided by three objectives	56
Figure 17: World Peak Greenhouse Emissions by 2016	58
Figure 18: The five most important environmental sustainability issues as nominated by residents	62
Figure 19: Average Electricity Consumption Comparison	69
Figure 20: Average Gas Consumption Comparison	69
Figure 21: Manningham's Renewable Energy Potential	74
Figure 22: Climate 2020 / Energy 2020 / Economy 2020	75

Tables

Table 1: Community - Supporting Strong, Informed, Capable, Resilient and Willing Communities **	18
Table 2: Fostering Sustainable Urban Development - Doncaster Hill Smart Energy Zone (SEZ) Action Plan **	18
Table 3: Leadership - Improving Council's Operational Performance **	18
Table 4: Community - Key Actions	21
Table 5: Council Leading the Way - Key Actions	22
Table 6: Business as Usual Community Profile - Households and Business by GHG Source	24
Table 7: Household and Individual Targets for maintaining 2005/06 levels and 20% reduction on 2005/06 levels	26
Table 8: Decarbonisation Targets - Community and Household	26
Table 9: Comparison between local government transport planning objectives and the VTP	30
Table 10: Community - Key Actions	32
Table 11: Summary of Council's Operational Energy Use	33
Table 12: Council Operations - Summary 2007/08	34
Table 13: Vehicle Fuels - GHG Emissions and Expenditure 2007/08	36
Table 14: Councils that have endorsed carbon neutral goals	38
Table 15: Leadership - Improving Council's Operational Performance	40
Table 16: NAGA Emissions by Source	52
Table 17: NAGA Emission Trends	53
Table 18: Summary of Emission Reduction by Strategy	54
Table 19: Summary of Strategy Application across NAGA Councils	55
Table 20: Summary of Policy Context	60
Table 21: Summary of Priority Issues for Residents - refer Figure 12	62
Table 22: Community - Supporting Strong, Informed, Capable, Resilient and Willing communities	82
Table 23: Fostering Sustainable Urban Development - Doncaster Hill Smart Energy Zone (SEZ) Action Plan	82
Table 24: Leadership - Improving Council's Operational Performance	83

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% 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 consisting 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

A Climate Wise Community by 2020

This is how residents of Manningham imagine 'A Climate Wise Community by 2020'.

community	Strong, informed, capable, resilient and willing
cool, green and natural	Manningham protects and enhances its natural environment; values trees for cooling and shade – nature's air conditioner; lessen 'heat island' effects by reducing impermeable surfaces.
thriving local 'new' economy	Innovative businesses providing world class sustainable products and services with plenty of local jobs
transport – <i>on the move</i>	Live, work, learn and play locally; walk and cycle often; otherwise carbon neutral mobility – whether it be effective and innovative public transport systems or green electric cars
houses and buildings <i>small eco footprints</i>	Carbon neutral – small ecological footprints; sustainable urban development and planning
energy / water / food / waste <i>smart and secure</i>	<p>energy: efficient, generating significant renewable energy locally backed up by buying green energy</p> <p>water: efficient, harvesting and re-used in laundries, toilets and gardens, low-water gardens, healthy rivers, lawns replaced</p> <p>food: locally or home grown and prepared, more farmers' markets, less food miles, reduced meat in diets</p> <p>waste: minimise waste to landfill, re-use, reduce and re-cycle</p>
leadership, innovation and learning	Council and community lead the way with demonstration projects and transition of Council's approach to energy

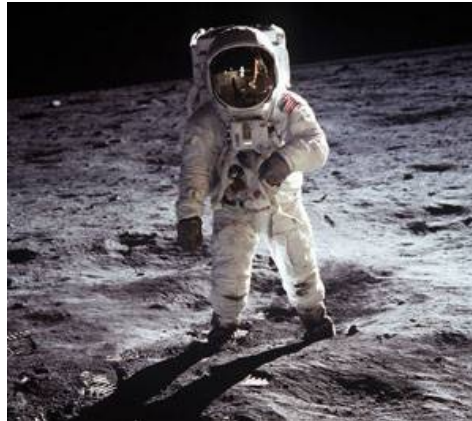
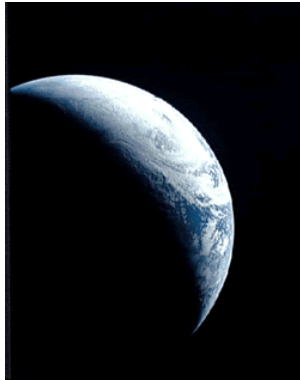


1 Introduction and Overview

1.1 The Challenge

“Today I challenge our nation to commit to producing 100 per cent of our electricity from renewable energy and truly carbon free sources within 10 years.”

Former US vice president Al Gore's 'moon challenge' 17 July 2008



The need for urgent action on climate change has been voiced by federal and state government leaders, leading scientists and many business people. Community awareness and desire for change has been heightened by the success of the film, *An Inconvenient Truth*, and then further highlighted by the release of *The Stern Report* by World Bank Chief Economist, Sir Nicholas Stern, and the *Garnaut Report* in Australia.

Global events such as Hurricane Katrina, the increased awareness of the developed world's economic dependence on cheap fossil fuel energy and the inevitable arrival of 'peak oil', have created a readiness within communities for real change. Closer to home, the ongoing Victorian drought, contrasted with the floods in Queensland, water restrictions, the frequency and severity of fires, food shortages, record high temperatures and deaths from heat stress, demonstrate the very impacts of climate change are already happening.

The world has become much smaller in the past few years. Climate change and the associated risk to our lifestyle, health, food security and peace have reinforced the reality 'we are all crew on spaceship earth'. We all share the same atmosphere. Pollution and greenhouse emissions into the biosphere, irrespective of the country of origin, ultimately impact every living species, not just humans.

There is little doubt we are heading for more turbulent times. A key challenge for the Manningham community and Council is how will we adapt and plan for inevitabilities such as climate change, peak oil, moving to a carbon constrained economy, resource taxes and carbon emissions trading.

To maximise opportunities to respond to this challenge, Council has prepared the Climate 2020 – A *Climate and Energy Action Plan* to direct Council and the community in moving forward.

1.2 An Economic Opportunity?

"Economic boom – not bust if we embrace decarbonisation of economy"
Rob Jackson, Clean Energy Council

According to leading scientists, achieving a 'safe climate' means reducing CO₂ concentrations in the atmosphere to 300ppm; the equivalent to pre-industrial levels. This requires a rapid decarbonisation of our energy system. Such a massive effort, if approached with the necessary policy in place, would generate an economic transition and create millions of green jobs.

Germany already has seen the creation of 250,000 new 'green' jobs since focusing on renewable energies. In Australia, the CSIRO report, *Growing the Green Economy*, predicted three million new jobs by 2025.

1.3 Community and Council Commitment to Climate Protection

Since 1998, the Manningham community and Council have been committed to the principle of climate protection. Firstly, in *Greenprint for a Sustainable City*, we declared a commitment to the principle of zero climate damage, and secondly, by implementing a *Local Action Plan for Zero Climate Damage (2001)* as part of its participation in the national and global *Cities for Climate Protection* program.

A recent community survey (*Understanding our Community; December 2008*) revealed 77 per cent of respondents agree (41 per cent) or strongly agree (36 per cent) with the statement "I am concerned about climate change". Only nine per cent disagree or strongly disagree with the statement.

1.4 Preparation of Climate 2020

Extensive research and community consultation has informed the preparation of Climate 2020, including:

- A three month community and staff consultation process included over 19 clubs representing 2000 members
- *You have the Power* home energy audits of 51 Manningham households
- *Carbon Rationing Action Groups* – carbon footprint assessments of 40 households
- Get ClimateWise Now! – workshops and survey completed by 35 attendees
- *Environment Matters* survey circulated through the community newsletter *Manningham Matters* generated 351 responses
- *Smart Energy Zone* project, partly funded by Sustainability Victoria, provided research into current and projected energy and greenhouse profiles for Doncaster Hill
- RMIT Centre for Design *Carbon Neutral Communities* project provided baseline energy and greenhouse profiles for Manningham plus an assessment of the renewable energy potential for the municipality
- NAGA's *Towards Zero Net Emissions* project provided regional greenhouse profiles across nine neighbouring municipalities, including a more detailed Manningham profile
- The recent community survey *Understanding our Community – December 2008*, confirmed earlier findings of community concern about climate change

1.5 How to Navigate this Document

This report is structured into a number of chapters. For a summary of the key elements of the Climate 2020 Action Plan refer to *The Vision* and Chapters 1 and 2. Below is an outline of all the Chapters:

Summary	Vision – A Climate Wise Community <i>by 2020</i>	
	Chapter 1: Introduction and Overview Presents the challenge and opportunity ahead and the method for preparing Climate 2020	
	Chapter 2: Climate 2020 Action Plan - <i>A Strategic Framework</i> Provides an overview of opportunities for greenhouse reductions at various scales: community, household and individual, regional, Doncaster Hill and Council operations	
Multiple Scales	Community	Chapter 3: Community - <i>Climate Wise by 2020</i> Addresses greenhouse reduction at community, household and individual scale
	Council	Chapter 4: Leadership - <i>Council Leads the Way</i> Outlines how Council will improve its performance
	Principal Activity Centre	Chapter 5: Doncaster Hill - <i>a Smart Energy Zone</i> Describes how Doncaster Hill can be progressed to a Smart Energy Zone(SEZ), with Council leading the way by transforming the Civic Precinct into a SEZ
	Regional	Chapter 6: NAGA - <i>regional carbon mitigation</i> Summarises the <i>Towards Zero Net Emissions – Plan for Getting to Zero</i> project across nine neighbouring municipalities
Context		Chapter 7: Context Provides economic and climate science background and policy overview, including Manningham, state, national and international
Consultation		Chapter 8: Consultation Summarises outcomes from various Climate 2020 consultation activities
Current Status		Chapter 9: Community - <i>Energy and Greenhouse Profiles</i> Details current and 2020 profiles for the municipality
Efficiency		Chapter 10: Efficiency - <i>Reducing Energy Demand</i> Describes opportunities for efficiency
Decarbonisation		Chapter 11: Decarbonisation - <i>Embracing Alternative and Renewable Energy Sources</i> Identifies various sustainable energy generation options

2 Climate 2020 Action Plan *A Strategic Framework*

2.1 Climate, Energy, Economy

Climate action is inextricably linked to energy and economic action because reducing our impact on climate systems relies on transitioning our energy and economic systems towards a future of efficient, decentralised and renewable energy (refer Figures 4 and 11).

Climate 2020 is the key implementation tool for community and Council action to allow each of us to contribute to closing the energy/economy gap and creating the necessary transition for a sustainable future. Climate 2020 shows how each of us, guided by the three objectives – efficiency, de-carbonise, leadership – can, through our choices and actions, no matter how small, accelerate the change that has already begun.

2.2 Climate 2020 Action Plan - Progressing the Manningham Community Towards a Climate Wise Future

The aim of the *Climate 2020 Action Plan* is to establish a broad framework to direct decision making and action to move the Manningham community towards a Climate Wise future by 2020. In particular, the three objectives – efficiency, decarbonise, leadership – and specific measurable goals for the community, Council operations and households, will shape Manningham's response to the climate challenge and contribute to the necessary reorientation of our energy/economy systems.

2.3 Scope

Climate 2020 addresses the energy we use in our daily our lives, referred to as operational energy.

Operational energy falls into two broad categories:

1. Stationary energy, typically gas and electricity
2. Transport energy, typically petrol, diesel and LPG

The focus of the Climate 2020 Action Plan is decarbonisation of our energy supply and efficient energy use.

Climate 2020 is essentially four action plans in one document, with the overarching action plan outlined in Chapter 2. Climate 2020 covers greenhouse reduction at four scales, in effect, comprising four sub-action plans for community, Council operations, principal activity centre (Doncaster Hill) and regional, as follows.

four action plans	details
Community	Households, business, transport, local economy, sustainable urban design and development (Chapter 3: Community – Climate Wise by 2020)
Council operations and service delivery	Building design, construction and operation, street lighting, vehicle fleet, local generation of Council's energy and efficiency (Chapter 4: Leadership - Council Leads the Way)
Doncaster Hill Principal Activity Centre	Building design, construction and operation, local economy, Civic Precinct development, Smart Energy Zones (Chapter 5: Doncaster Hill Smart Energy Zone)
Regional	Regional action through the Northern Alliance for Greenhouse Action (NAGA) comprising Moreland Energy Foundation Limited and nine member Councils - Banyule, Darebin, Hume, Manningham, Melbourne, Moreland, Nillumbik, Whittlesea and Yarra (Chapter 6: NAGA Regional Carbon Mitigation).
Overarching Action Plan	Refer Chapter 2 : Climate 2020 Action Plan – A Strategic Framework

2.4 What is not covered by Climate 2020?

Climate 2020 does not address embedded energy or climate adaptation.

Embedded energy refers to all the energy required to manufacture a good or service, transport it to your doorstep and dispose of it once it has finished its usefulness. Typically embedded energy is addressed indirectly through green purchasing programs or 'zero-waste-to-landfill' waste strategies.

Adaptation to climate change presents new challenges and risks for local government in relation to service delivery (Section 4.6). While Climate 2020 does not address climate adaptation and risk management, one of its recommendations is to investigate how to develop a climate adaptation strategy for Manningham.

2.5 Why a Climate 2020 Plan?

The impacts of climate change are already being experienced through high summer temperatures, deaths through heat stress, higher frequency and severity of bushfires, severe drought, water restrictions, gardens and trees dying due to lack of rain, turf on sports fields dying, extreme weather events (drought in Victoria and floods in Queensland), and food prices rising due to crop failure.

Leading scientists say we have until 2016 to hit 'peak greenhouse emissions' and be on a trajectory to achieve 100 per cent (cf 1990) reductions by 2050 (Chapter 7). Without any action at all emissions from this municipality will increase by 21%. Climate 2020 is an action plan to allow the community and Council to contribute effectively to accelerating the necessary transition of our energy / economy for a sustainable future.

2.6 Why Decentralised Energy Systems?

Centralised energy infrastructures waste more than two thirds of their energy and use large amounts of water for cooling. For every 100 units of energy generated, 61.5 units is lost at the point of generation. Of the remaining 38.5 units, 3.5 units is lost during transmission so only 35 units of energy is supplied to the energy user (refer Figure 1). Centralised systems are not only energy inefficient; they also consume large volumes of water. In Victoria, coal generation at Yallourn requires the equivalent of 20 per cent of metropolitan Melbourne's annual water supply. This equates to approximately two litres of embedded water for every kWh of electricity consumed.

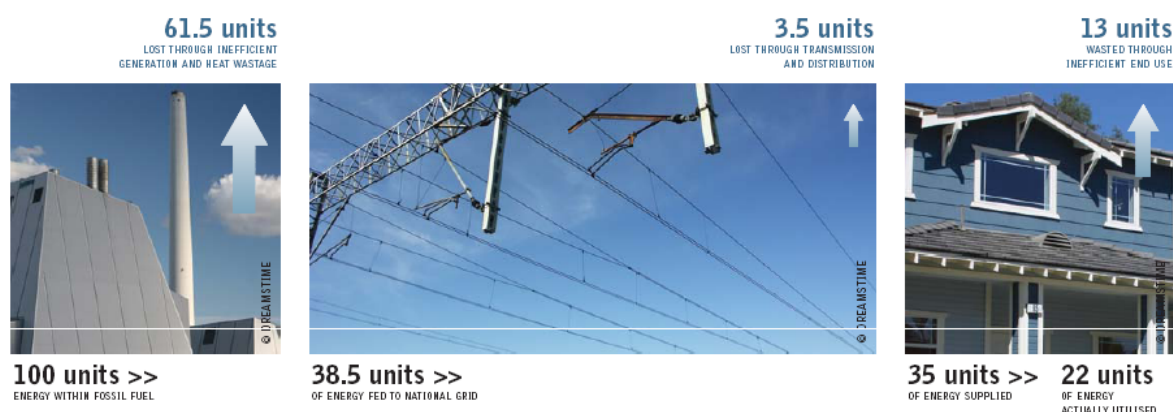


Figure 1: Energy losses of centralised energy systems

2.7 A Decentralised Energy Future

The urban centres of tomorrow's networked world could produce power and heat as well as consuming it. The roofs and facades of public buildings are ideal for harvesting solar energy. 'Low energy' can become the standard for all buildings. Governments committed to tight climate protection targets will be able to impose strict conditions and offer incentives for renovating these buildings. This will help create jobs.

suburbs

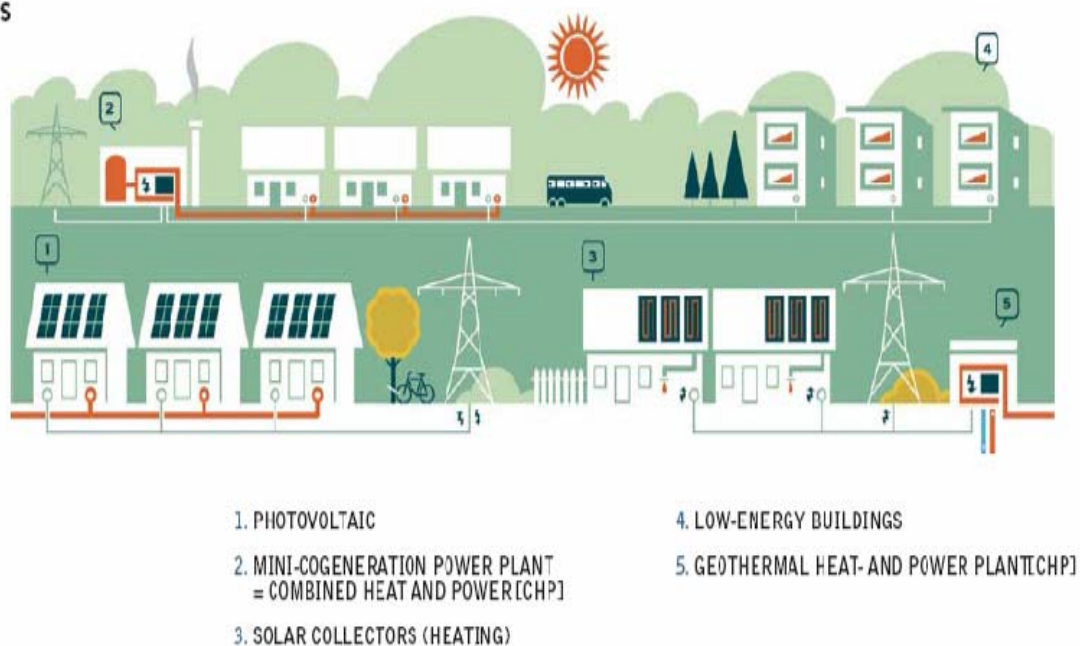


Figure 2: A decentralised energy suburb of the future

2.8 Pathway to Zero Net Emissions

The pathway to zero net emissions comprises six steps:

1. Developers improve building design to reduce requirements for lighting and heating, ventilation and cooling (HVAC)
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 sourced locally where practical / economical; conversion to green electric vehicles
6. Carbon offset the remainder

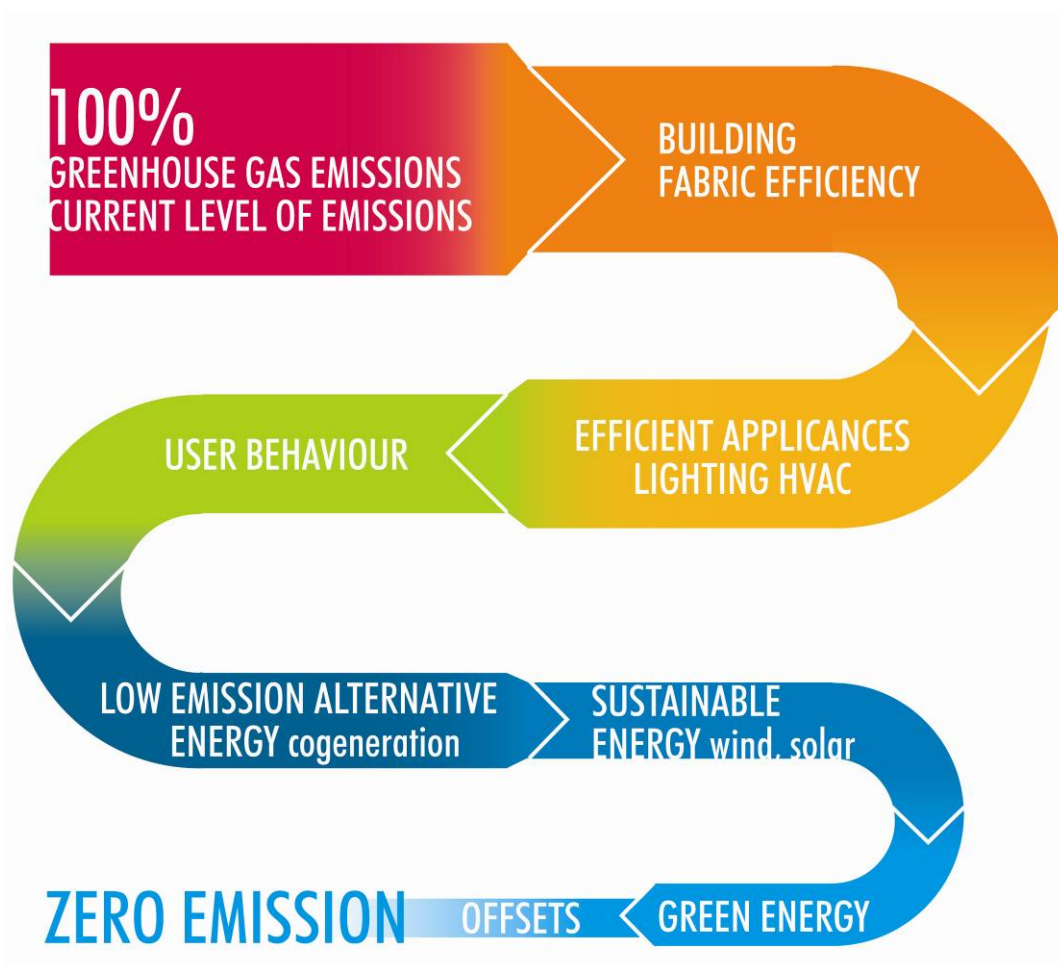


Figure 3: Pathway to Zero Net Emissions

2.9 Strategic Framework

The Climate 2020 Action Plan is underpinned by a single strategic framework which is consistent with, and progresses and replaces, the *Cities for Climate Protection – Local Action Plan for Zero Climate Damage* (2001). It provides a pathway for reducing greenhouse emissions by increasing energy efficiency and decarbonising our energy supply. Climate 2020 empowers the community and Council to be part of the necessary reorientation of our energy / economy from:

PAST:
inefficient, centralised, carbon based → **Climate 2020 FUTURE:**
efficient, decentralised, low carbon, solar / renewables

2.9.1 The Vision

A Climate Wise Community by 2020

2.9.2 Three objectives

Efficiency Reduce energy demand – buildings, lighting, appliances, heating, ventilation and air conditioning (HVAC)

Decarbonise Embrace sustainable local energy generation, GreenPower and green electric vehicles

Leadership Community and Council leads the way – 100% carbon neutral Council by 2020

2.9.3 The goals / targets

Goals	Community	Council	Household
	20% GHG reductions (3.5 tonnes per year per individual)	* 100% carbon neutral by 2020 (operational energy)	minimum 20% GHG reduction (10.3 tonnes per year per household)
How to get there	20% energy efficiency (5.0 kWh per day per individual)	20% energy efficiency (energy efficient streetlights and Council buildings)	20% energy efficiency (14.7 kWh per day per household)
	20% decarbonise energy supply (20% GreenPower)	20% decarbonise energy supply	20% to 100% renewable / GreenPower
	200 x 1kW household energy generation units installed per year equiv to 2.36MW by 2020	40% of Council energy requirements generated locally (Civic Precinct Smart Energy Zone and depot)	1 x kW household energy generation
	1 MWh local energy generation installed by business per annum – total of 9 MWh by 2020	30% offsets / GreenPower	
	15% of cars to be green electric by 2020	100% green electric cars in vehicle fleet (or other carbon neutral solutions)	1-in-3 households to drive a green electric car

NB: all targets based on 2005/06 ABS data, and/or NAGA *Towards Zero Net Emissions – Plan for Getting to Zero* (2009)

* refer Section 4.4.3

2.9.4 Policy Drivers for Council

The following policies support achieving the above goals:

activity	policy driver
Street Lighting	Improve the environmental sustainability of street lighting assets to reflect best practice
Buildings - design and construction	Minor Council Buildings: minimum 4 star NABERS energy and water ratings Major Council Buildings: minimum 5 star NABERS energy and water ratings minimum 6 star GreenStar
Buildings - operation and retrofits	Minor Council Buildings: continually improve operating performance through monitoring of operational performance, sustainable retrofits, considering bulk electricity purchase on behalf of tenants Major Council Buildings: active energy management of major Council facilities to continually improve operating performance
Vehicles	Improve energy efficiency of vehicle fleet and reduce carbon footprint
Sustainable and / or renewable energy generation	Embrace local energy generation; consider potential sites, especially major new projects as potential hosts
Energy management and optimisation	Invest in community and Council capacity building to optimise energy savings, and opportunities to implement renewable or sustainable energy generation locally, thereby future proofing Council and the community

Council will pursue a carbon neutral target (refer Section 4.4.2) in order to:

- Future proof Council and community – greater energy security
- Ensure financial certainty in the long term to minimise exposure to rising utility costs and carbon markets
- Continue the development of best practice energy and climate change capability within Council, so Council can better serve the community
- Attract external funding and optimise linkages with existing and new programs, both internal and external

2.9.5 Eight Key Strategies

As a result of extensive and targeted consultation, along with research, eight key strategies were identified to drive the delivery of the vision, *A Climate Wise Community by 2020*, guided by the Climate 2020 objectives – *efficiency, decarbonisation, leadership*. These strategies are:

Strategy	Description
Community <i>education and capacity building</i>	Design and deliver programs supporting strong, informed, capable, resilient and willing communities
Environment <i>cool, green and natural</i>	Manningham protects and enhances its natural environment, values trees for cooling and shade (nature's air conditioner), decreases 'heat island' effects by reducing impermeable surfaces.
Local Economy <i>thriving and green</i>	Encourage the development of innovative businesses providing sustainable products and services with plenty of local jobs
Transport <i>on the move</i>	Live, work, learn and play locally, walk and cycle often, other carbon neutral mobility such as effective and innovative public transport systems or green electric cars
Sustainable Urban Development and Planning	Promote, support and facilitate leading practice
Operational Performance	Continuous improvement through open and transparent monitoring of actual performance
Governance	Investigate and develop the necessary structures, arrangements, and advocacy - organisational, legislative and non-legislative - to drive delivery of Climate 2020 goals and objectives
Leadership	Community and Council leads the way, - sustainable building assets, energy efficient street lighting, carbon neutral Council by 2020, green electric vehicles, generating own energy



2.10 Program Approach to Implementing the Climate 2020 Action Plan

Climate 2020 adopts a program approach to implementation of actions, guided by objectives – efficiency, decarbonisation, leadership - to realise goals.

Climate 2020 programs aim to reinject energy capacity back into the community's and Council's core skill set. These programs are an investment, not a cost. They will result in savings to ratepayers and increase our ability to attract substantial funding, such as: Sustainability Victoria's Smart Energy Zone (\$2.5million) fund and the Federal Government Green Precinct (\$15million) funds.

Climate 2020 adopts an integrated approach and progresses existing programs. It identifies resources and investment necessary to build capacity at all scales; community, household, Council operations and regionally.

In particular, the following Tables outline how Climate 2020 aims to allocate resources:

- **Table 1: Supporting Strong, Informed, Capable, Resilient and Willing Communities.** Continue the delivery of community education and capacity building programs including Get ClimateWise Now!, Carbon Rationing Action Groups (CRAGs) and Solar Homes, a group residential purchase programs (also see Chapter 3)
- **Table 2: Fostering Sustainable Urban Development and Planning.** Focus on Doncaster Hill Smart Energy Zone (SEZ), Civic Precinct development, Accelerating Sustainable Building and Green Business Catalyst (also Chapter 5)
- **Table 3: Improving Council's Operational Performance.** Focus on building Council's own capacity in relation to decarbonisation of energy supply and increasing efficiency: energy generation, sustainable building, energy efficient street lighting, active energy management, monitoring and reporting (also Chapter 4); whilst
- **Continuing existing programs, and optimising linkages** with new and existing programs, internal and external; and
- **Attracting funding,** in-kind support and establishing strategic partnerships.

2.10.1 Cash Flow

The Table below summarises the cash flow for new programs outlined in Tables 1, 2 and 3:

Action plan	2009 / 10	2010 / 11	2011 / 12
Climate 2020	\$69,000	\$69,000	\$69,000
SEZ	\$110,000	\$80,000	\$80,000
Totals	\$179,000	\$149,000	\$149,000



Figure 4: A resident takes advantage of the Solar Homes bulk photovoltaic purchase program (photo courtesy *Manningham Leader* 11 February 2009)

Table 1: Community - Supporting Strong, Informed, Capable, Resilient and Willing Communities **

Program	Details	Strategy	Funding
Get ClimateWise Now!	Increased capacity to deliver climate and energy action programs to the community such as Get Climate Wise Now! workshops, Carbon Rationing Action Groups (CRAGs) and LESS, free installation of energy efficient lights and showerheads	Community Operational Performance	Climate 2020
Solar Homes (self funded)	Increased capacity to facilitate residential group purchase of sustainable household technologies thereby increasing household level resilience and micro infrastructure	Community	Self Funded
Community Environmental Education	Continue to design and deliver environmental sustainability programs with a particular focus on waterway health, sustainable living, youth leadership and healthy horse pasture management	Community	Existing
Green Wedge Strategy	Working closely with the community to protect Manningham's natural environment for now and future generations	Environment <i>cool, green and natural</i>	Existing

Table 2: Fostering Sustainable Urban Development - Doncaster Hill Smart Energy Zone (SEZ) Action Plan **

Program	Details	Strategy	Funding
Smart Energy Zone	Increased capacity to promote, advocate and facilitate more sustainable urban development with regards to energy demand, distributed energy generation, building performance, metering and monitoring, and attracting external funding	Governance	SEZ Action Plan
Accelerating Sustainable Building	Increased capacity to drive sustainable building and urban development on Doncaster Hill, for major developments and across Council Capital Works, and attract external funding	Sustainable Urban Development and Planning	SEZ Action Plan
Green Business Catalyst	Increased capacity to promote sustainable business practices, attract/create innovative 'new' green economy businesses, form strategic partnerships, generate new jobs, and attract funding	Local Economy	SEZ Action Plan

Table 3: Leadership - Improving Council's Operational Performance **

Program	Details	Strategy	Funding
Climate 2020	Increased capacity to respond to the challenges of energy efficiency, decarbonising our energy system, adapting to climate change, attracting external funding and participation in NAGA regional alliance	Governance	Climate 2020
Energy Smart	Increased capacity to investigate and implement local energy generation solutions to meet Council's own energy needs, deliver energy efficient lighting, and attract external funding	Leadership Operational Performance	Climate 2020
Sustainable Building Operation	Increased capacity for Council to deliver energy efficient buildings through effective retrofits, proactive energy management, benchmarking, and attract external funding	Leadership operational performance	Climate 2020
GOGO	Continue to develop the necessary organisational culture, knowledge and skills to deliver improved sustainability performance	Education and Capacity Building Leadership	existing
SHE Q RMS	An integrated approach to safety, health, environment and quality risk management	Governance Operational Performance	existing
Ecofootprint System	Increased capacity to proactively drive Council's environmental performance improvement, develop the necessary tools supporting proactive energy management, benchmarking, and diagnostics, monitoring and reporting through EcoTracker	Education and Capacity Building Leadership Operational Performance	Climate 2020

** refer to Appendix 1: Climate 2020 Programs and Budgets

2.11 Pathways to a Carbon Neutral Council

The graph below provides an overview of how to become a carbon neutral Council. If you cast your attention to the right vertical axis in the Figure below, you will observe a number of pathways for achieving zero greenhouse emissions by 2020.

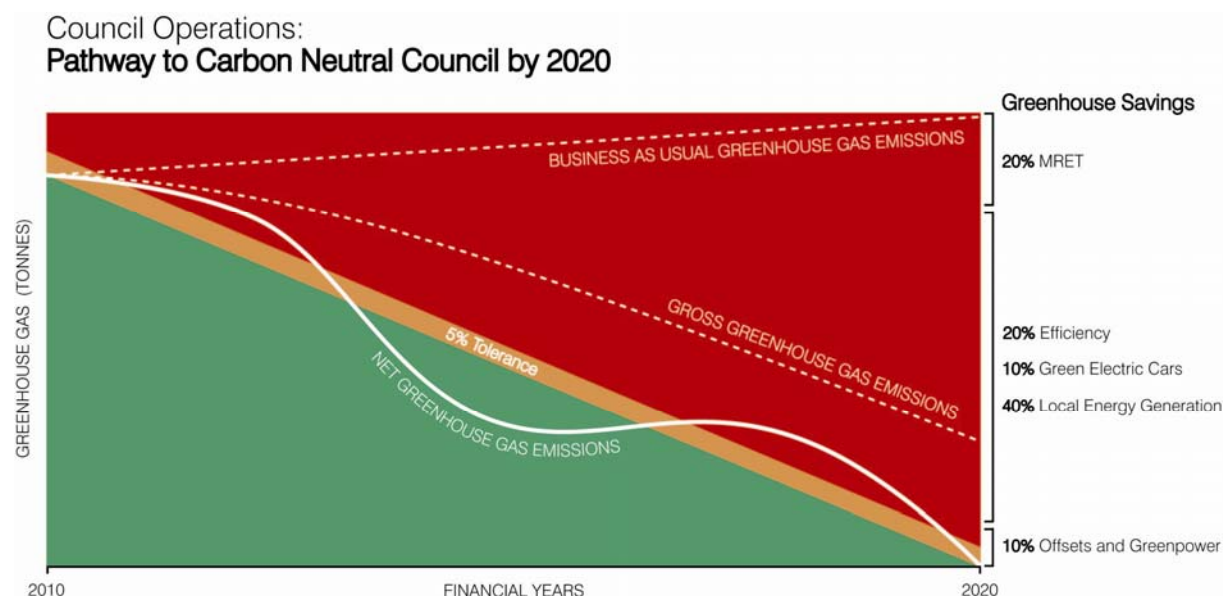


Figure 5: Council Operations - Pathway to a Carbon Neutral Council by 2020

2.11.1 Detailed Modelling of how Council will be 100% Carbon Neutral by 2020

Through the Climate 2020 Implementation Plan, Council has identified a number of initiatives and programs to achieve its goal of being 100 per cent carbon neutral by 2020. The graphs on the following page model the implementation of specific mitigation initiatives and depict the reduction of greenhouse emissions to zero as a result of implementing Climate 2020.

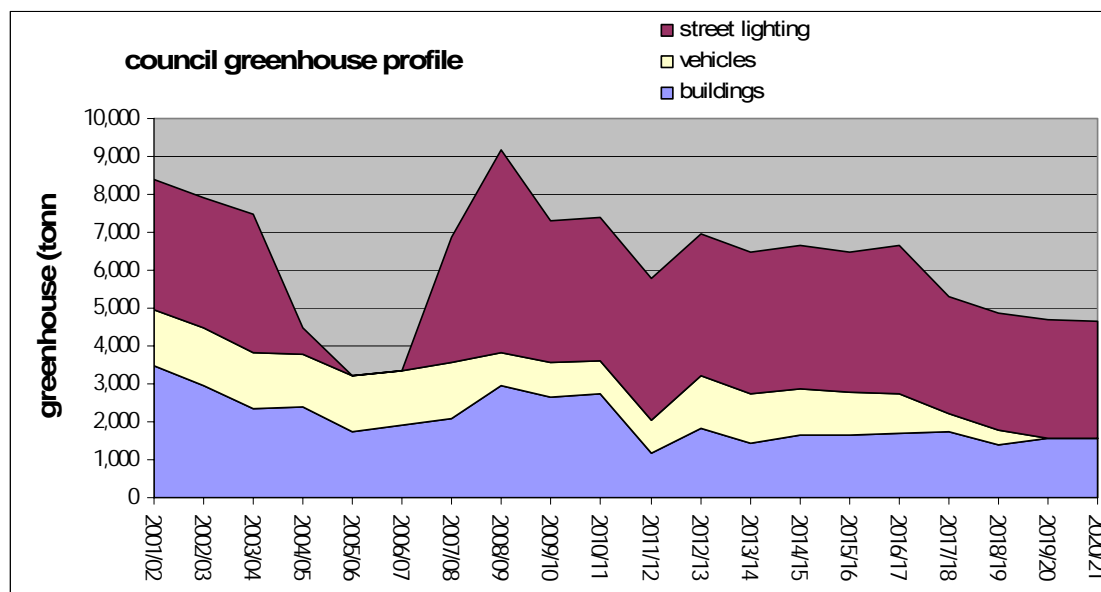
Efficiency goals are achieved by:

- Changeover to energy efficient street lighting
- Making community facilities more energy efficient through sustainable retrofits to a minimum of NABERS 4 star energy and water for minor buildings and 5 star NABERS for major buildings, proactive energy management of major facilities, changing occupant behaviour, monitoring and reporting on operational performance, and negotiating bulk electricity purchase contract on behalf of tenants
- Improved energy efficiency of vehicle fleet through maintenance, driver education, and purchase of more energy efficient vehicles

Decarbonisation of energy supply is reflected in:

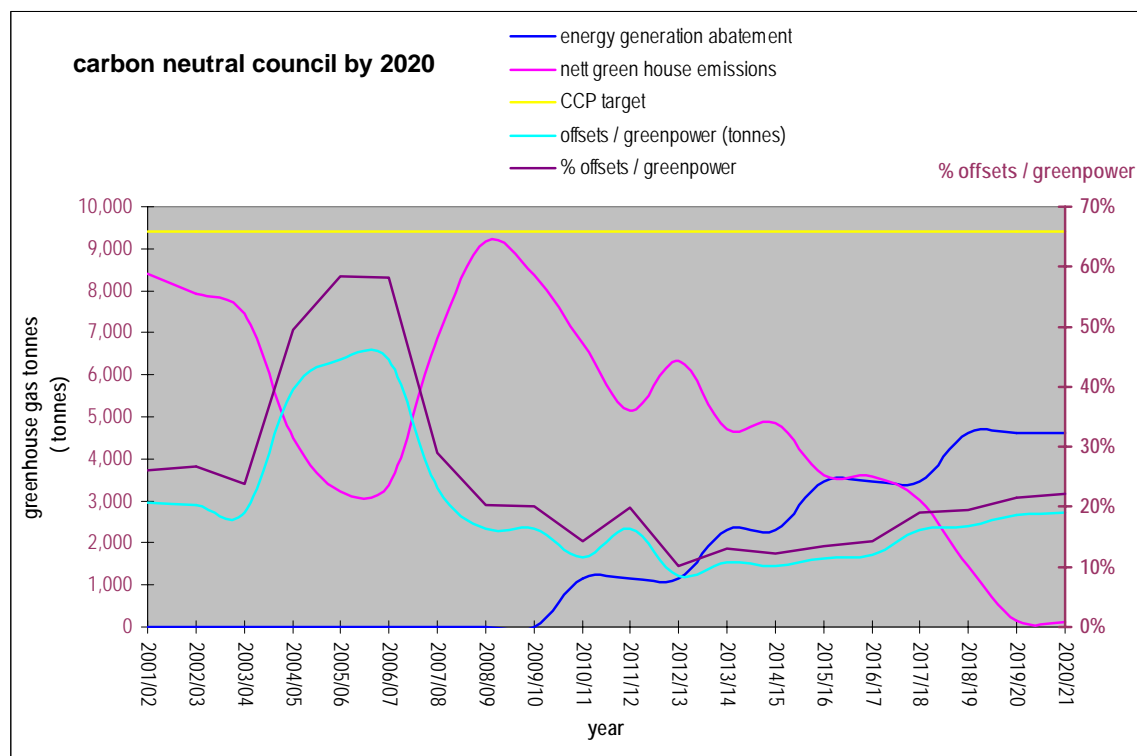
- Gradual conversion of Council cars to green electric or equivalent carbon neutral mode
- Increased sustainable energy generation; typically 500 kW tri-generation systems
- Purchase of GreenPower

Carbon offsets and GreenPower are used to reduce residual emissions, typically ranging from 12 to 25 per cent (refer graphs over page).



NB: net greenhouse profiles include efficiency initiatives, GreenPower and offsets

Figure 6: Climate 2020 Forecast Council Greenhouse Profile – Street Lighting, Vehicles and Buildings



NB: Net greenhouse profiles include efficiency initiatives, GreenPower and offsets

Figure 7: Climate 2020 Modelling for a Carbon Neutral Council by 2020

2.12 Key Actions

While many initiatives were identified through the consultation and research process (refer Appendix 2: Climate 2020 Implementation Plan), the key actions listed below represent the shift required if community is going to realise its Vision of a Climate Wise Community by 2020.

Tables 4 and 5 list key actions for the community and Council respectively.

Table 4: Community – Key Actions

programs	community – Climate Wise by 2020	strategies
Solar Homes (self funded)	Continue with Solar Homes, residential bulk purchase program, aim for * 200 x 1kW units per year * 20% GreenPower / renewable energy	Community Operational Performance
Get ClimateWise Now! CRAGs	Continue with the Get ClimateWise Now! and Carbon Rationing Action Groups (CRAGs) programs, promoting individual, household and municipal targets, in particular * 20% improved energy efficiency	Community Operational Performance
SEZ Accelerating Sustainable Building Green Business Catalyst	Progress the Doncaster Hill Smart Energy Zone by * Aiming for a total of 9 MW installed tri-generation by 2020 * Zero emission buildings by 2030 * Accelerating sustainable building and distributed energy systems * Establishing a Green Business Catalyst program	Governance Sustainable Urban Design and Development Local Economy
Get ClimateWise Now!	Strengthen and promote carbon neutral mobility, such as walking, cycling and public transport options, and also * Develop and implement a green electric car program to achieve 15% adoption of green electric cars by 2020 – i.e. 1 in 3 households to own an electric car by 2020	Transport Community
SEZ Accelerating Sustainable Building	Progress sustainable built environments by establishing a minimum of: * 5 star homes or better (FirstRate energy rating) * 5 star NABERS for all major buildings whether on Doncaster Hill or elsewhere in the municipality * 4 star NABERS for all other buildings	Sustainable Urban Design and Development Operational Performance



Table 5: Council Leading the Way - Key Actions

Program	Council – Leading the Way	Strategy
Energy Smart	Investigate appropriate technologies, funding solutions required to implement energy efficient street lighting, local energy generation and effective purchase of renewable energy offsets	Leadership Operational Performance
Climate 2020 Ecofootprint System	Council to adopt an energy producer/ investment approach to its energy portfolio, in particular: <ul style="list-style-type: none"> * Develop an energy management model optimising the mix of efficiency, energy generation, GreenPower and offsets purchase, and carbon pollution liabilities * Develop and implement energy generation solutions to supply 40% of our own energy requirements * Progress the Revolving Sustainability Fund 	Governance Operational Performance Leadership
SEZ Accelerating Sustainable Building	Demonstrate leadership with the new Civic Precinct development by building a leading sustainable building, and transforming the Civic Precinct into a Smart Energy Zone (SEZ) and Green Precinct.	Governance Leadership Sustainable Urban Design and Development Operational Performance
GOGO Ecofootprint System	Continue to improve the energy efficiency of vehicle fleet and convert all Council cars to green electric or carbon neutral by 2020	Leadership Operational Performance
Sustainable Building Operation Ecofootprint System	Continue to accelerate sustainable building design, construction and operations within Council's building asset portfolio, in particular <ul style="list-style-type: none"> * Minimum 5 star NABERS for major buildings, and all other buildings minimum of 4 star NABERS * Implement a sustainable building retrofit program * Monitor building performance and establish benchmarks * Proactively manage energy and water on all HVAC systems within major buildings * Consider negotiating a bulk energy contract on behalf of tenants 	Leadership Sustainable Urban Design and Development Operational Performance

2.13 Strategic Framework

The strategic framework employed for each of the action levels – community (Section 3), Doncaster Hill (Section 4), Council operations (Section 5) and regional (Section 6) – follows the structure outlined in the Table to the right.



2.14 Climate 2020 Wheel: A Strategic Framework

The key elements of the Climate 2020 Action Plan have been summarised in the graphic – Climate 2020 Wheel - on the following page.



climate 2020 wheel the strategic framework



the vision—climate wise by 2020

community

20% greenhouse gas reduction
20% energy efficiency
20% de-carbonise energy supply
15% green cars

council

100% carbon neutral by 2020
20% energy efficiency
40% de-carbonise energy supply through
local energy generation
100% green electric car fleet

pathway to
zero emissions

100%
GREENHOUSE GAS EMISSIONS
CURRENT LEVEL OF EMISSIONS

BUILDING
FABRIC EFFICIENCY

USER BEHAVIOUR

EFFICIENT APPLIANCES
LIGHTING HVAC

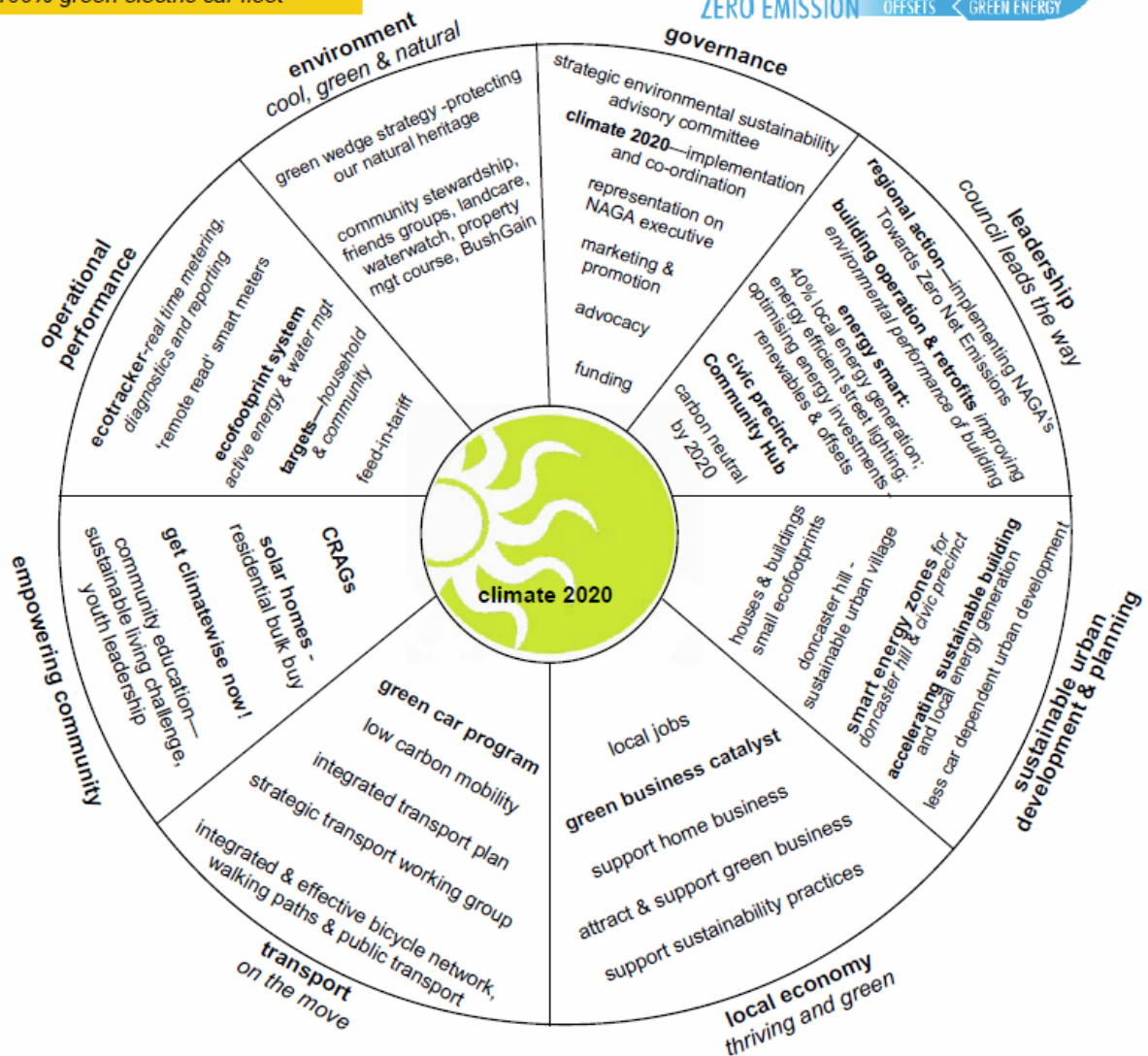
LOW EMISSION ALTERNATIVE
ENERGY cogeneration

SUSTAINABLE
ENERGY wind, solar

ZERO EMISSION

OFFSETS

GREEN ENERGY



three objectives

efficiency

reduce energy demand - buildings, lighting, appliances, heating, ventilation & air conditioning (HVAC)

de-carbonise

embrace sustainable local energy generation, renewables and green electric vehicles

leadership

council and community lead the way

3 Community *Climate Wise by 2020*

3.1 Community Greenhouse Profile

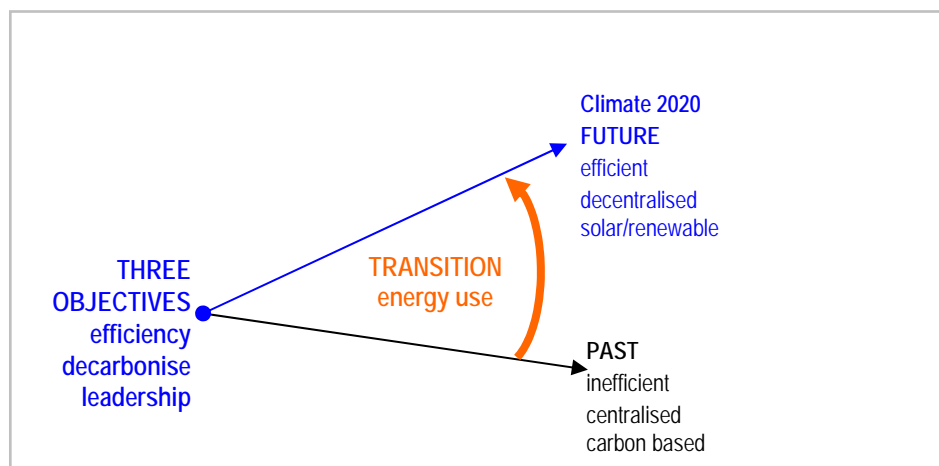
Manningham is predominantly a residential municipality, with some retail and commercial activity and negligible industry. Approximately 70 per cent of greenhouse emissions can be attributed to the residential sector and 30 per cent to business. This distribution remains much the same up to 2020 (Table 6).

	2005/06			2020		
	%Total Community	Households	Business	%Total Community	Households	Business
Stationary Energy (gas and electricity)	63%	40%	23%	66%	44%	22%
Transport	30%	27%	3%	28%	25%	3%
Waste	6%	2%	4%	6%	2%	4%
Total	99%	69%	30%	100%	71%	29%

Table 6: Business-as-Usual Community Profile - Households and Business by GHG Source

In the following Sections, emissions, actions and targets are explored for each of the sectors - residential, business and transport. Guided by the three objectives – efficiency, decarbonisation, leadership - opportunities are then identified with a vision to reorient energy use to a more sustainable and climate wise future by 2020 (Figure 4).

Figure 8: Necessary Climate 2020 transition of energy use guided by the three objectives



Three objectives – efficiency, decarbonise, leadership

Where the three objectives are:

- Efficiency** Reduce energy demand – buildings, lighting, appliances, heating, ventilation and air conditioning (HVAC)
- Decarbonise** Embrace sustainable local energy generation, GreenPower and green electric vehicles
- Leadership** Council and community leads the way – 100% carbon neutral Council by 2020

3.2 Residential Sector - Householders have the Power

As Table 6 shows, approximately 70 per cent of greenhouse emissions can be attributed to the residential sector with household stationary energy (gas and electricity) use comprising 40 per cent of the total community emissions, private transport 27 per cent and household waste two per cent.

Consequently households play a large role in realising the Vision of a Climate Wise Community by 2020.



3.2.1 Stationary Energy (gas and electricity) Targets and Mitigation Actions

In the next few years to 2020, under a business-as-usual scenario, stationary residential greenhouse emissions in Manningham are predicted to rise 34 per cent (Figure 5 and Chapter 9).

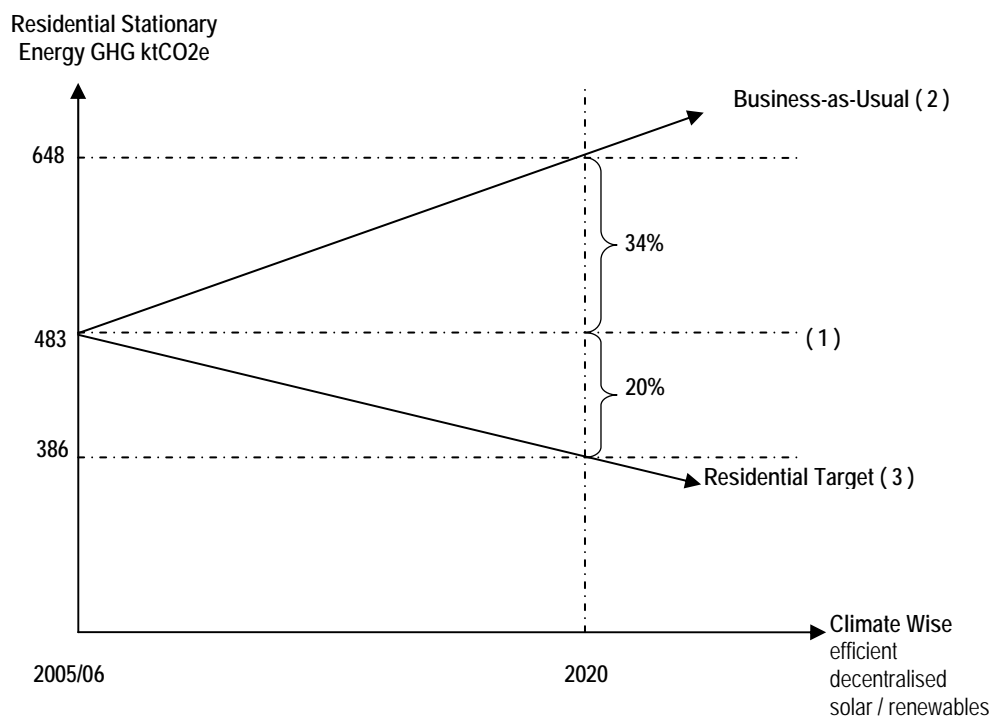


Figure 9: Residential Stationary Energy Emissions

3.2.2 Efficiency - Household Targets

Participating in Carbon Rationing Action Groups (CRAGs) allows residents to determine their own carbon budget. Table 7 provides a series of benchmark targets to allow households and individuals to gauge their greenhouse emissions and energy use when compared with:

- 2005/06 GHG emissions of 483 ktCO₂e per annum, indicated on Figure 9 by '(1)'
- 2020 business-as-usual GHG emissions of 648 tonnes, indicated on Figure 9 by '(2)'
- 20% GHG reduction when compared to 2005/06 for a total annual emission of 386 ktCO₂e – effectively a 68 per cent reduction on BaU, (indicated on Figure 9 by '(3)')

Community Emissions	(1) 483 ktCO ₂ e		(2) 648 ktCO ₂ e		(3) 386 ktCO ₂ e	
Target	(1) Maintain 05/06 Levels		(2) 2020 Business as Usual		(3) 20% Reduction 05/06 Baseline	
Scale	Individual	Household	Individual	Household	Individual	Household
GHG tonnes per year	4.4	12.9	5.1	15.0	3.5	10.3
GHG kg per day	12.0	36.4	14.0	42.5	9.9	29.1
kWh per day	6.3	18.4	6.9	20.3	5.0	14.7
MWhr pa	2.3	6.7	2.5	7.4	1.8	5.4
Household % Energy Efficiency cf with 2020 BaU		34%		0%		68%
Total Community GHG Savings pa ktCO ₂ e		165				262

Table 7: Household and Individual Targets for maintaining 05/06 levels and 20% reduction on 05/06 levels

3.2.3 Decarbonisation - Household Targets

Householders have a number of strategies available to decarbonise their energy supply:

- Purchase 20 to 100 per cent renewable/ GreenPower
- Install a minimum of 1 kW local and renewable energy generation (e.g. a 1 kW photo voltaic array)
- Convert from a petrol car to a green electric vehicle

The Table below presents these decarbonisation targets at both scales – community and household.

Community Target	ktCO ₂ e saved	Household Target
20% decarbonise energy supply	143	20 to 100% renewable / GreenPower
200 units x 1kW hhd energy generation installed per year 2.36 MW installed by 2020	30	1 x kW household energy generation
15% of cars to be green electric by 2020	56	1 in 3 households to drive a green electric car

Table 8: Decarbonisation Targets – Community and Household

3.2.4 Community Programs

Current education and capacity building programs aim to:

- Foster strong, informed, capable, resilient and willing communities
- Drive improved residential performance through the installation of sustainable technologies at a household level
- Support the Climate Wise theme, 'smart and secure - energy/water/food/waste'
- Promote and facilitate reorientation of our energy/economy driven by efficiency, decarbonisation and leadership
- Support greenhouse reduction by promoting efficiency, decarbonisation and leadership
- Increase understanding, support and achievement of Climate 2020 goals
- Attract funding and resources as they become available; for example, through the Living Green with LESS program energy saving light bulbs and shower heads will be provided and installed in residences in Manningham for free

Recommended Actions

Program	Details
Get ClimateWise Now!	Continue to design and deliver climate and energy action programs to the community such as vendor information workshops, Carbon Rationing Actions Groups (CRAGs), energy efficiency and energy audits, LESS free light globe and shower replacement, promote and facilitate the take up of green electric cars and other forms of low carbon mobility
Solar Homes (self funded)	Continue to facilitate residential group purchase of sustainable household technologies to increase household resilience and micro infrastructure; for example, photo voltaic arrays, solar hot water systems, solar air conditioning, insulation, bulk 'renewable' GreenPower purchase, green electric vehicles
Community Environmental Education	Continue to design and deliver environmental sustainability programs with a particular focus on waterway health, sustainable living, youth and healthy horse pasture management



3.3 Business Sector

Greenhouse emissions generated from business activity comprise approximately 30 per cent of the municipality's emissions. Stationary energy (gas and electricity) use constitutes approximately 22 per cent of total municipal emissions, transport three per cent and commercial waste four per cent (Section 3.1).

3.3.1 Business Programs

Strategy	Description
Thriving Local 'New' Economy	Innovative businesses providing world class sustainable products and services with plenty of local jobs

Our Vision of a Climate Wise Community in 2020 is one with a thriving local 'new' economy. In particular, the Doncaster Hill Smart Energy Zone attracts innovative businesses providing world class sustainable products and services with plenty of local jobs. By 2020, Manningham has many examples of leading sustainable building design, construction and operation. Businesses are savvy in how they use energy; they are efficient, generate their own and aim for renewable sources.

The three programs in the Doncaster Hill Smart Energy Zone Action Plan (August 2009) are:

1. Smart Energy Zone
2. Accelerating Sustainable Building
3. Green Business Catalyst

These three SEZ programs aim to educate, build capacity and foster new business development and local jobs, by:

- Continuing to develop a thriving local 'new' economy and grow employment opportunities
- Driving improved business performance through the installation of sustainable technologies and improved energy efficiency
- Promoting and facilitating the reorientation of our energy/economy driven by the efficiency, decarbonisation and leadership
- Establishing business networks and strategic partnerships supporting innovation and success
- Increasing the understanding, support and achievement of the Doncaster Hill Smart Energy Zone and Climate 2020 goals
- Attracting funding and resources as they become available

Recommended Actions

Program	Description
Smart Energy Zone **	Promote, advocate and facilitate sustainable urban development with regard to energy demand, distributed energy generation, building performance, metering and monitoring, and attracting external funding
Accelerating Sustainable Building **	Drive sustainable building and urban development on Doncaster Hill, for major developments and across Council Capital Works, and attract external funding
Green Business Catalyst **	Promote sustainable business practices, attract/create innovative 'new' green economy businesses, form strategic partnerships, generate new jobs, and attract funding

** denotes program requiring funding (refer Chapter 2, Tables 1, 2 and 3, and Appendix 1: Climate 2020 Programs and Budgets)

3.3.2 Decarbonisation - Business Targets

As utility costs soar, it will become more cost advantageous for business to invest in its own energy generation capacity. The Smart Energy Zone program for Doncaster Hill aims to establish intelligent distributed energy systems on the Hill and support developers, property owners and businesses generate their own heating, cooling and power. The Climate 2020 target for business is to install a total of 9 MWh of sustainable energy generation by 2020, at a rate of 500kW to 1.5 kW per year.

Sector	Community Target	ktCO ₂ e saved
Business	9 MWh of sustainable energy generation at a rate of 500kW to 1.5 kW per year	22

3.4 Transport Sector – Emissions, Congestion and Noise

Greenhouse emissions generated from transport sector comprise approximately 30 per cent of total community emissions with 27 per cent originating from the residential sector (Section 3.1).

Since 2004, Council has advocated for the Doncaster Rail, extension to the tram network and improvements to the span and frequency of bus services within the eastern region, with a particular emphasis on Manningham. Council's advocacy activities for major improvements to the span and frequency of bus services have also been undertaken in collaboration with the Eastern Transport Coalition (ETC) and the Metropolitan Transport Forum (MTF).

3.4.1 State Government Transport Planning

The *Victorian Transport Plan* (VTP) released by the State Government in December 2008 was prepared in response to the recommendations of the *Eddington Report* and identifies an extensive program of transport improvements in Victoria.

The Plan offers short and long term benefits, that would directly or indirectly impact on Manningham. Notably, there has been significant investment:

- \$360 million for the implementation of the Enhanced Doncaster Area Rapid Transit (DART) bus system
- \$6 billion to complete the link between the Metropolitan Ring Road in Greensborough and the Eastern Freeway in Bulleen
- \$440 million to grade separate level crossings, most notably the Springvale Road / Whitehorse Road intersection in Nunawading

Other initiatives include:

- Trials for new technologies for greener vehicle
- Improvement of road links to Melbourne's outer suburban communities
- Creation of new bicycle lanes in inner Melbourne and Central Activities Districts

While the VTP identifies improvements and upgrades in the rail system, it does not address the issue of a rail option along the Doncaster corridor.

In response to the VTP, the Municipal Association of Victoria (MAV) developed a position paper which includes seven key objectives and outlines the key areas of importance to local government. A comparison of the actions within the VTP against these strategic objectives shows the VTP is deficient in cycling and walking, and integrated long term planning for transport.

Objective	No. Projects Meeting Objective (out of 45 projects)	% met
1 – Environment and Climate Change	28	62%
2 – Modal Shift	14	31%
3 – Equity and Access	13	28%
4 – Recognition of Cycling and Walking	3	6%
5 – Integrated Long Term Planning	0	0%
6 – Economic Efficiency	30	66%
7 – On going public transport investment	26	57%

Table 9: Comparison between Local Government Transport Planning Objectives and the VTP

The above analysis shows the projects do meet the key objectives of climate change, modal shift, equity and access, economic efficiency and ongoing public transport investment.

However, the VTP is deficient in meeting cycling and walking, and the major objective of integrated long term government planning for transport. While the Victorian Transport Plan also aims to deliver major transport projects to ensure Victoria remains one of the most livable places in the world, it does not identify a means of measuring and managing the plan's success.

Direct VTP benefits for Manningham include:

- \$360 million to implement the Enhanced Doncaster Area Rapid Transit (DART) system. The allocation comprises \$40 million for capital expenditure (i.e. new buses, bus stops) over a three year period and \$320 million for operational costs over a 10 year period
- Implementation of the Orbital SmartBus services through Manningham
- Improved bus services operating at higher frequencies and longer span of hours

3.4.2 Walking and Cycling

At a local level, pedestrian and cycling plans for activity centres support walking and cycling as viable alternatives to driving. Activity centre plans for Jackson Court and Doncaster Hill have already been developed

3.4.3 Greener Vehicles – Decarbonisation and Efficiency

With increasing evidence of climate change and the advent of rising fuel prices in the past two years, consumers have asked for greener, low carbon, efficient cars. Car manufacturers have responded in a number of ways, for example offering:

- Small and highly fuel efficient cars – e.g. Smart Car by Daimler Mercedes
- Hybrid cars – Toyota Prius, Honda Hybrid (electric / petrol)
- Electric cars – Mitsubishi MIEV, Ford Volt

Manningham is largely a car dependent community. As greener cars become more available and affordable, an opportunity exists to develop a program to promote ownership of greener vehicles.

Recommended actions

- Strengthen and promote walking, cycling and public transport options. In particular, continue to develop pedestrian and cycling plans for activity centres (e.g. Jackson Court, Doncaster Hill)

- Develop and implement a green electric car program aiming for 1 in 3 households to own a green electric car by 2020
- Continue advocating to the State Government to undertake a feasibility study towards the provision of a rail line to address congestion and commuting times along the Eastern Freeway and offer the Manningham community a broader transport choice
- Acknowledge the State Government's proposed significant funding boost for provision of a world class bus system in Manningham
- Continue advocating directly, and through the MAV and other forums, to further enhance an integrated transport planning approach, adopt success criteria measurement as part of the plan, and address cycling and walking

3.5 Key Actions

While many initiatives were identified through the consultation and research process (refer Appendix 1), the key actions below represent the shift required if the community is going to realise its Vision of a Climate Wise Community by 2020.

Table 10: Community – Key Actions

Programs	Community – Climate Wise by 2020	Strategy
Solar Homes (self funded)	continue with Solar Homes, a residential bulk purchase program, aiming for * 200 x 1kW units pa * 20% GreenPower / renewable energy	Community Operational Performance
Get ClimateWise Now! CRAGs	Continue with the Get ClimateWise Now! and Carbon Rationing Action Groups (CRAGs) programs, promoting individual, household and community targets, in particular: * 20% improved energy efficiency	Community Operational Performance
SEZ Accel Sustainable Building Green Business Catalyst	Progress the Doncaster Hill Smart Energy Zone by: * Aiming for a total of 9 MW installed trigeneration by 2020 * Zero emission buildings by 2030 * Accelerating sustainable building and distributed energy systems * Establishing a Green Business Catalyst program	Governance Sustainable Urban Design and Development Local Economy
Get ClimateWise Now!	Strengthen and promote carbon neutral mobility, including walking, cycling and public transport options, and also * Develop and implement a green electric car program * 15% adoption of green electric cars by 2020 (i.e. 1 in 3 households to own an electric car by 2020)	Transport Community
SEZ Accel Sustainable Building	Progress sustainable built environments by establishing a minimum of * 5 star NABERS for all major projects - Doncaster Hill or elsewhere in Manningham * 4 star NABERS for all other buildings	Sustainable Urban Design and Development Operational Performance
STAC * /EEP	Continue to strengthen and promote walking, cycling and public transport options, in particular, continue to develop pedestrian and cycling plans for activity centres (e.g. Jackson Court , Doncaster Hill)	Transport
Get ClimateWise Now	Develop and implement a green electric car program aiming for 1 in 3 households to own a green electric car by 2020	Transport
STAC	Continue advocating to the State Government to undertake a feasibility study towards the provision of a rail line to address congestion and commuting times along the Eastern Freeway and to offer the Manningham community a broader transport choice	Transport
STAC	Continue advocating directly, and through the MAV and other forums, to further enhance an integrated transport planning approach, adopt success criteria measurement as part of the plan, and address cycling and walking	Transport

* STAC – strategic transport advisory committee



4 Leadership *Council Leads the Way*

4.1 Council Leading the Way

Residents are saying they want Council to lead the way. For Council's own buildings to be well designed, functional and sustainable; street lighting to be energy efficient and less carbon intensive; our vehicle fleet to convert to green electric cars; to undertake sustainable retrofits of our existing building stock; generate our own power; use renewable energy; be more energy efficient and less reliant on fossil fuels; reduce our greenhouse emissions overall and become carbon neutral.

This Section details what would be required for Council to achieve the following Climate 2020 goals:

- 100% Carbon Neutral by 2020
- 20% Energy efficiency
- 20% Decarbonise energy supply
- 40% Local generation of Council's energy requirements
- 100% Green electric cars in vehicle fleet

4.2 Council Operations – Greenhouse, Expenditure, and Energy and Greenhouse profile

Data provided on operational energy (Figure 10 and Tables 11 and 12) indicate a number of opportunities for efficiency, decarbonisation and leadership:

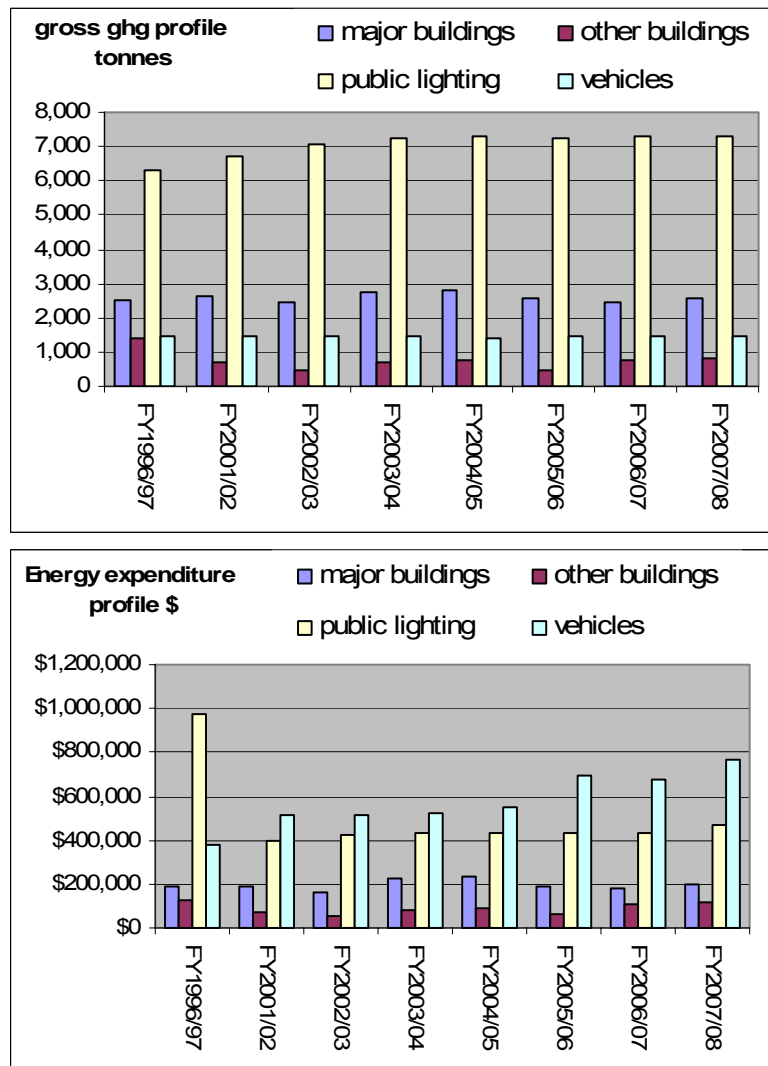
Efficiency	Decarbonisation
Public lighting offers the most significant opportunity for energy efficiency and GHG reduction	GreenPower / renewable energy minimum purchase of 20%
Buildings in their design, operation and retrofits promise efficiency gains	Sustainable local energy generation to replace centralised, coal generated electricity
Vehicles fuel efficient vehicle fleet, well maintained, driver education	Conversion from petrol to green electric vehicles

	% GHG* (tCO ₂ e)	\$	% Energy (GJ)
Buildings	28%	21%	24%
Public lighting	60%	30%	36%
Vehicles	12%	49%	40%

Based on FY2007/08 data; GHG* represents 'gross' emissions (i.e. before GreenPower or offsets deducted)

Table 11: Summary of Council's Operational Energy Use

Figure 10: Trends in annual Council GHG Emissions and Expenditure



	% GHG* (gross)	\$	Energy	Electricity (MWh)	Gas (GJ)	Net GHG (tonnes)
Major buildings	22%	13%	19%	1,774	3,473	1224
Other buildings	7%	8%	5%	603	607	842
Public lighting	58%	30%	35%	5,073		3324
Vehicles	13%	49%	40%	refer Table 11	refer Table 11	1441
Total	100%	100%	100%	7,450	4,080	6831

* This is the gross GHG figure (i.e. before GreenPower or offsets have been taken into account)

Table 12: Council Operations - Summary 2007/08

4.3 Energy efficiency

When striving for greenhouse reductions, improved energy efficiency is the first objective. Climate 2020 aims for 20 per cent energy efficiency for Council operations; 16 per cent from street lighting and four per cent from buildings (equivalent to 10 per cent more efficient operation of buildings).

4.3.1 Energy Efficient Street Lighting

Street lighting contributes 60 per cent to Council greenhouse profile and a 16 per cent reduction in total energy for Council. A batch changeover to energy efficient street lighting will result in a minimum 66 per cent energy efficiency gain per light. Barriers to achieving this are financial, regulatory and lack of choice in terms of technology. Currently, choice is restricted to compact fluoro technology, yet Light Emitting Diode (LED) technology is being implemented in China, but is yet to be offered by distributors in Victoria.

Recommended actions

- Continue participation in the NAGA street lighting working group
- Continue progressing the changeover to energy efficient street lighting, including advocacy through NAGA and other channels, attracting state and federal funding, and investigating technology options
- Investigate GreenPower options prior to batch changeover, and after, and make necessary GreenPower purchases as appropriate



4.3.2 Sustainable Building Design, Operation and Retrofits

It is recommended:

- New Council buildings be designed and operated to a minimum 4 star NABERS energy and water rating, and major new buildings to a minimum 5 star NABERS energy water rating and 5 star GreenStar
- All new buildings be carbon neutral, achieved through distributed energy generation and purchase of renewable energy / GreenPower and offsets
- Proactive energy management of major buildings using the Ecofootprint System and Ecotracker
- Opportunities for sustainable energy generation pursued as appropriate
- Investigate placing all tenants under single electricity and gas contracts that include renewable energy / GreenPower
- Investigate benchmarking of all Council owned buildings
- Investigate incorporating necessary design and operational performance tools (e.g. NABERS, SDS scorecard, STEPS, LCADesign, MUSIC) into current Council capital works practice

4.3.3 Energy Efficient Vehicles

Petrol prices have risen in recent years due to lack of security of supply, a result of geopolitical instability and the advent of Peak Oil. Increasing evidence of climate change has also led to the demand for efficient cars powered by green fuels such as biodiesel and green electricity.

Recommended action

For Council to continue improving the energy performance of its vehicle fleet through:

- Assessment of new technologies
- Driver education
- Regular maintenance
- Intranet based vehicle booking system
- Policies supporting improved energy performance of the vehicle fleet
- Continually improve monitoring, benchmarking and reporting

	GHG* (tonnes)	\$	litres
Petrol	759	\$420,549	316,416
Diesel	586	\$308,464	217,068
LPG	96	\$34,031	59,826
Total	1,441	\$763,044	593,310

Table 13: Vehicle fuels – GHG Emissions and Expenditure 2007/08



4.4 Decarbonisation

4.4.1 Addiction to Cheap Fossil Fuels

For a 'safe-climate', CO₂ concentrations at preindustrial levels of 300 to 325 parts per million are necessary (refer Section 7). Efficiency on its own will not get us where we need to be; only decarbonisation of our energy supply will. What does this mean? Instead of creating carbon pollution through oil, gas and petrol use, we harvest the unlimited supply of solar income including wave energy, geothermal, solar thermal, photo voltaic, biomass, etc.

Essentially, we have to stop undoing the good work Mother Nature has done for the past 4.5 billions years. She was the first to sequester CO₂ deep within the earth's crust as coal, oil and gas, so the chemical composition of the biosphere and oxygen levels were set just right for life as it has evolved to today.

One of the forces accelerating the advance of industrial revolution, especially post World War 2, and accompanying population growth, was the availability of cheap energy. Low cost carbon based fuels have often been the invisible drivers of expansion, wealth, prosperity, quality of life and technological innovation. There has also been a down side - climate change and pollution to name but two.

Our problem is our economy is addicted to cheap fossil fuels, and part of the challenge of reorientating the energy / economy is to wean ourselves off this addiction.

Hopefully the 2008/09 global financial crisis is seen as an opportunity to reorient energy and economic systems. Consumption based economies have natural limits, whereas ecological economies mimic nature (biomimicry).

Reward Harvesting solar income, carbon abatement and efficiency

Encourage Smart decentralised energy systems, resilience and inbuilt redundancy

Penalise Inefficiency and carbon pollution

4.4.2 Carbon Neutrality – A Pathway to Zero Net Emissions

The term *carbon* is a short form common term for greenhouse gas.

Sources for greenhouse gas emissions include fossil fuel use across all sectors, land clearing, waste in landfill and waste waters, and by-product of some industrial processes.

Definition: Carbon Neutral Community / Council

A community / Council that has zero net greenhouse gas emissions

Ultimately, the aim is to have zero net emissions from all sources: operational energy, embedded energy, and waste. Technically, let alone financially, this is a very challenging goal, especially if just starting out on the decarbonisation path. As a first stage, Manningham City Council will pursue carbon neutrality for operational energy (i.e. electricity, gas and vehicle fuels).

4.4.3 Why a 100% Carbon Neutral Council by 2020?

As a Council, there are a number of reasons to pursue carbon neutrality by 2020:

- Residents are saying they want 'Council to lead the way'
- 77 per cent of respondents to a recent community survey say they are concerned about climate change (*Understanding our Community*, December 2008)
- Demonstrating real leadership offers hope, especially when change at state and federal levels is slow and minimal
- Sets an example for community
- Future proofs Council and community – greater energy security
- More financially sustainable strategy in the long term; minimises exposure to rising utility costs and carbon markets
- Establishing best practice energy and climate change capability within Council, positions Council to better serve its community and attract external funding

4.4.4 Are there other Carbon Neutral Councils?

There are a numbering of councils considering carbon neutral goals:

Banyule, Boroondara, Casey, Frankston, Maroondah (carbon neutrality by 2020), Moonee Valley, Mornington Peninsula, Nillumbik, Wyndham

There are even more councils committed to carbon neutrality:

Table 14: Councils that have endorsed carbon neutral goals

Council	Corporate	Community
Bayside	Zero net emissions by 2020	n/a
Darebin	Carbon neutral by 2020	
Hobsons Bay	Carbon neutral by 2020	Carbon neutral by 2030
Hunters Hill (NSW)	Reduce emissions from 2005 levels by 20% by 2010, by 50% by 2020 and by 100% by 2050	Reduce emissions from 2001 levels by 10% by 2010, by 30% by 2020 and By 60% by 2050
Maribyrnong	Carbon neutral by 2015	Carbon neutral by 2020
Melbourne	Zero net emissions by 2020	Zero net emissions by 2020
Moreland	Carbon neutral by 2020	Carbon neutral by 2030
Port Phillip	Zero greenhouse gas emissions by 2020	n/a
Sydney (NSW)	100% offset of greenhouse gas emissions from Council operations by 2008	70% below 1990 levels by 2050
Yarra Ranges	Carbon neutral since 2008	n/a
Yarra City	Carbon neutral by 2012	2020
Whitehorse	Carbon neutral by 2015 - 100% GreenPower for street lighting, until energy efficient light changeover	-

4.4.5 How do we get to 100% carbon neutral for operational energy?

There are a number of scenarios to become a carbon neutral Council by 2020:

#	Strategy	Details	Cost / Investment Per Year	% Premium
1.	Purchase a mix of GreenPower and offsets	100% GreenPower for electricity 100% offset for vehicle fuels and gas	* \$393,951 per year	26%
2	Purchase 100% offsets	Purchase offsets for all operational energy – electricity, gas and fuels – does not include waste emissions	* \$285,835	19%
3.	Invest in capacity building programs for Council and initiatives such as: energy efficiency, local energy generation, and purchase offsets or GreenPower for the remainder	Energy efficient street lighting, energy efficient buildings, green electric cars, trigeneration, solar air conditioning, windpower	Investment in Council capacity building \$31,000 and community capacity building \$148,000 per year plus an extra \$30,000 in the first year	-

* offset / GreenPower expenditure is variable, dependent on markets (difficult to budget for). Figure based on 2007/08 data and \$25 per tonne



4.5 Improving Council's Operational Performance

Since energy deregulation in the early 1990s, energy has not been part of local government's core business. Climate 2020 signals the pendulum is about to swing back. Climate 2020 programs aim to reinject energy capacity back into Council's core skill set. These programs are an investment, not a cost. They will result in savings to ratepayers and increase our ability to attract substantial funding, such as \$15 million Green Precinct Fund (DEWHA) and \$2.5 million Smart Energy Zone (Sustainability Victoria).

Climate 2020 adopts an integrated approach to delivering the necessary new resources required to build capacity within the relevant service units – Major Projects, Assets and Engineering, Civic Buildings and EEP. In particular, it aims to allocate resources for:

- **Improving Council's operation performance:** focus on building Council's own capacity in relation to energy and efficiency including energy generation, sustainable building, contracting and project management, energy efficient street lighting, active energy management, monitoring and reporting, and attracting funding and in kind support.

Detailed program briefs are provided in the appendix.

Table 15: Leadership - Improving Council's Operational Performance

Program	Details	New / Existing Program	Strategy
Climate 2020 **	Increased capacity to respond to the challenges of energy efficiency, decarbonising our energy system, adapting to climate change and attracting external funding, and participation in NAGA regional alliance	New	Governance
Energy Smart **	Increased capacity to meet Council's own energy needs locally, deliver energy efficient lighting, and attract external funding	New	Leadership Operational Performance
Sustainable Building Operation **	Increased capacity for Council to deliver energy efficient buildings through effective retrofits, proactive energy management and benchmarking, and attract external funding	New	Leadership Operational Performance
Ecofootprint System **	Increased capacity to proactively drive Council's environmental performance improvement, develop the necessary tools supporting proactive energy management, benchmarking, and diagnostics, monitoring and reporting through EcoTracker	Existing	Education and Capacity Building Leadership Operational Performance
GOGO	Continue to develop the necessary organisational culture, knowledge and skills to deliver improved sustainability performance	Existing	Education and Capacity Building Leadership Operational Performance
SHE Q RMS	An integrated approach to safety, health, environment and quality risk management	Existing	Governance Operational Performance

** denotes program requiring funding (refer Chapter 2, Table 3)

4.6 Climate Adaptation - Responding to Climate Change

The scope of the Climate 2020 Action Plan is greenhouse reduction as it relates to operational energy, stationary and transport. Climate adaptation is not addressed directly.

4.6.1 Key Challenges for Local Government

Local government is responsible for implementing many diverse programs, policies and regulations set down by state and federal governments, directly or indirectly, influencing climate change mitigation and adaptation. Councils also have to respond to local community needs and have powers to set their own regulations and local laws, and provide a range of discretionary services within each geographically defined boundary.

Briefly, Council functions affected by climate change:

- Asset management
- Economic development
- Natural resource management
- Emergency management
- Health and aged care
- Community education and engagement
- Storm water
- Water use
- Resource recovery and waste management
- Facilities management
- Public lighting
- Land use and development
- Transport

4.6.2 Local Government Risk and Liability

"Local Government provides for the health, safety and welfare of its community and if a Council cannot show that it has taken preventative action against any threat to the health, safety and welfare of its community, it faces the possibility of liability costs - costs which can be reduced if a Council identifies the threats to its community and implements appropriate strategies to prevent these threats"

(Local Government Association of Tasmania, 2004).

The effects of climate change will have direct and indirect implications for local government. There will be differences in the extent to which these impacts are specifically felt by the communities of a local government area.

Councils must assess how climate change will impact on their constituency and act accordingly. Failure to do so could result in unnecessary risks to staff, community members and lead to unnecessary financial losses, infrastructure damage and maintenance costs. Local government may face legal liabilities as a result of their actions or inactions, decisions and policy responses that may either contribute to or be affected by climate change.

Recommended action

Investigate how to develop a climate adaptation plan for the Manningham community.

5 Doncaster Hill *A Smart Energy Zone*

5.1 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 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 will be generated to align community needs with appropriate sustainable solutions. Such a zone could include:

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

5.2 Progressing Doncaster Hill as a Smart Energy Zone

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

Efficiency	Reducing energy demand and greenhouse emissions
Decarbonise	Embracing local sustainable energy generation
Leadership	Innovation - 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 for bringing about change so Doncaster Hill moves towards its vision for becoming a renowned sustainable urban precinct.

5.3 The SEZ Action Plan

The SEZ Action Plan is the key implementation tool for directing how the future demand for energy will be managed so the Doncaster Hill area 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.

5.4 Scope

The Doncaster Hill SEZ Action Plan focuses on reducing what is called 'stationary energy'; energy consumed for all uses other than transport. In fact, the SEZ Action 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 the increasing demand for and supply of electric vehicles.

5.5 Why a SEZ plan?

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

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 11 and 12).

Figure 11: Reduced Energy Usage by Sector

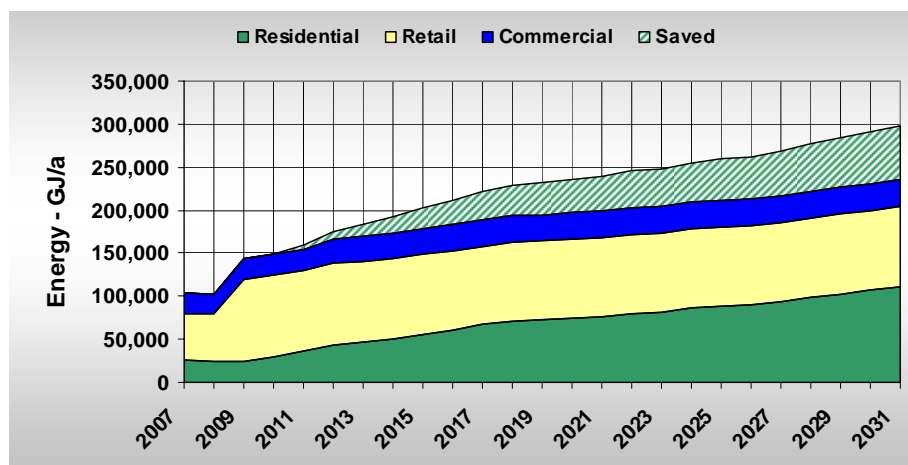
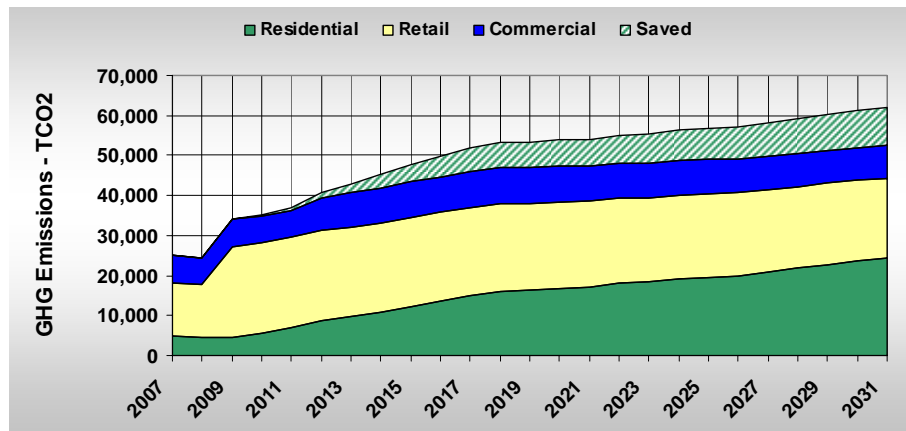


Figure 12: Reduced GHG Emissions by Sector

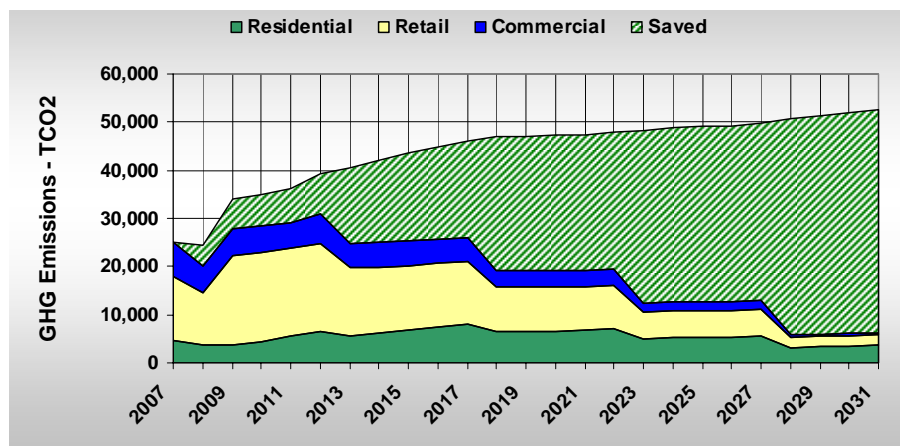


5.6 Further Reducing Greenhouse Gas Emissions

In conjunction with reducing energy demand, the SEZ Action Plan addresses the supply side, offering alternatives to traditional coal generated power (refer Chapter 9) such as local sustainable energy generation or the purchase of accredited GreenPower from the electricity grid.

Figure 13 demonstrates that with a combination of reduced demand for energy and incremental increases in alternative energy sources Doncaster Hill can become a zero emissions precinct. This demand could be met by an array of alternative or 'GreenPower' options with the aim for Doncaster Hill to reduce its emissions impact to zero by 2031. It depicts an incremental rise of 20 per cent of all power being sourced from alternative sources every five years.

Figure 13: Greenhouse gas emissions reduction based on use of renewable energy sources



5.7 Pathway to Zero Net Emissions

The pathway to zero net emissions comprises six steps:

1. Developers design efficient buildings 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 and economical
6. Carbon offset the remainder

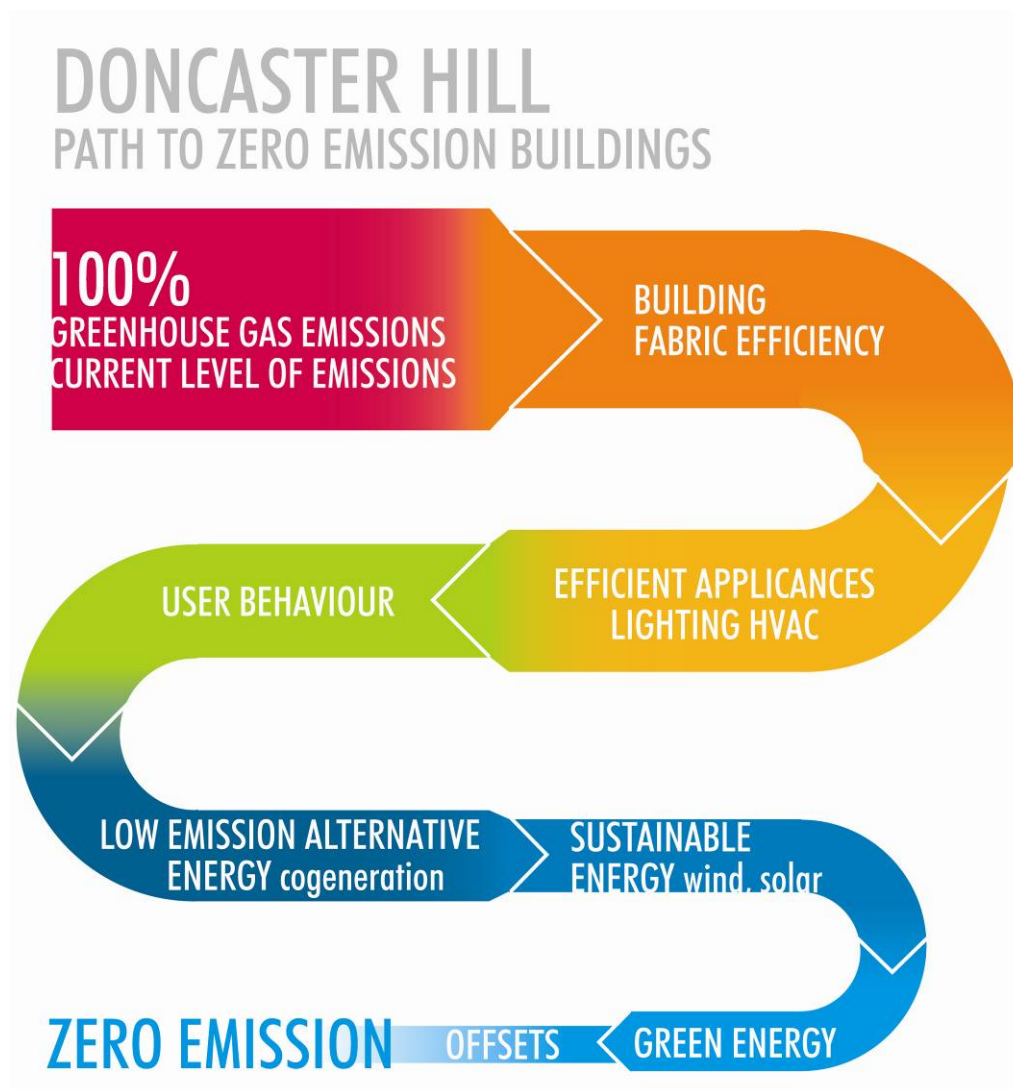


Figure 14: Doncaster Hill – Pathway to Zero Emission Buildings

5.8 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.

5.8.1 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.

5.8.2 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.

5.8.3 Three objectives

1. Efficiency - reduce energy demand
2. Decarbonise – embrace sustainable local energy generation, GreenPower and green electric vehicles
3. Leadership - establish Doncaster Hill as a sustainability laboratory

5.8.4 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.

Strategy	Description
Community Education and Capacity Building	Design and deliver programs that support strong, informed, capable, resilient and willing communities
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 to support innovation and the emergence of Doncaster Hill as a sustainability laboratory at all levels, including 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.
Operational Performance	Continuous improvement through open and transparent monitoring of actual performance
Funding	Attracting ongoing funding through traditional and innovative mechanisms

5.9 Program Approach to Implementation of the SEZ Action Plan

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

Program	Description	Associated Strategy	Investment
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 the 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	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, form strategic partnerships, and attract funding	Local Economy	\$30,000 seed funding for one year

The two remaining strategies will be incorporated into existing programs:

Program	Description	Associated Strategy	Investment
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	Community <i>education and capacity building</i>	Existing program
Doncaster Hill Place Making	Aim to establish a sense of place and identity for the Doncaster Hill principal activity centre	Place Making	Existing program

5.3 Investment

Funding for the implementation programs associated with the SEZ Action Plan is outlined above and amounts to a total of \$110,000 in the first year and \$80,000 in years two and three.

5.4 Key Actions

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

Strategy	Action
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; 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
Leadership and Learning	gain state and federal government support for the designation of Doncaster Hill as an area in which regulations may be varied to enable innovative sustainability initiatives to be implemented and trialled egg decentralised micro-infrastructure
Accelerating Sustainable Building	establish Doncaster Hill area as a leader in sustainable buildings and intelligent distributed energy systems by: adoption of necessary tools - NABERS performance rating tools, LCADesign; driving the implementation of intelligent distributed energy generation, smart meters, intelligent HVACs and building energy management systems; continuously improving the Sustainability Management Plan process and tools that support improved design, tendering, construction and operation of buildings both within Council's capital works and the wider municipality
Local Economy	through the Green Business Catalyst program establish the necessary conditions, structures, support and partnerships that attract and nurture 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 which draw attention to the area as a sustainability precinct

5.5 Further information

For more detailed information refer to the relevant Section in the Doncaster Hill Smart Energy Zone Action Plan (August 2009). The key elements of the SEZ Action Plan have been summarised in the graphic – Smart Energy Zone wheel, which is provided in the appendix 5 of the Doncaster Hill Smart Energy Zone Action Plan.

6 NAGA *regional carbon mitigation*

Manningham City Council is one of nine member Councils, plus the Moreland Energy Foundation Limited that form the Northern Alliance for Greenhouse Action (NAGA). NAGA has been successful in receiving Sustainability Accord funding for the project – Towards Zero Net Emissions – a regional approach to carbon mitigation. The Sections below provide background information on NAGA and a summary of the action plan – Plan for Getting to Zero.

6.1 Overview

6.1.1 Victorian greenhouse alliances

The Victorian Greenhouse Alliances were formed as part of the Victorian Greenhouse Strategy 2002, with the aim of implementing climate change action, building capacity of local government and community and improving integration and targeting of government services and programs. There are six alliances in Victoria, which comprise of 50 of Victoria's 79 municipalities and also include State government departments, Catchment Management Authorities (CMA), educational institutions, businesses and community groups.

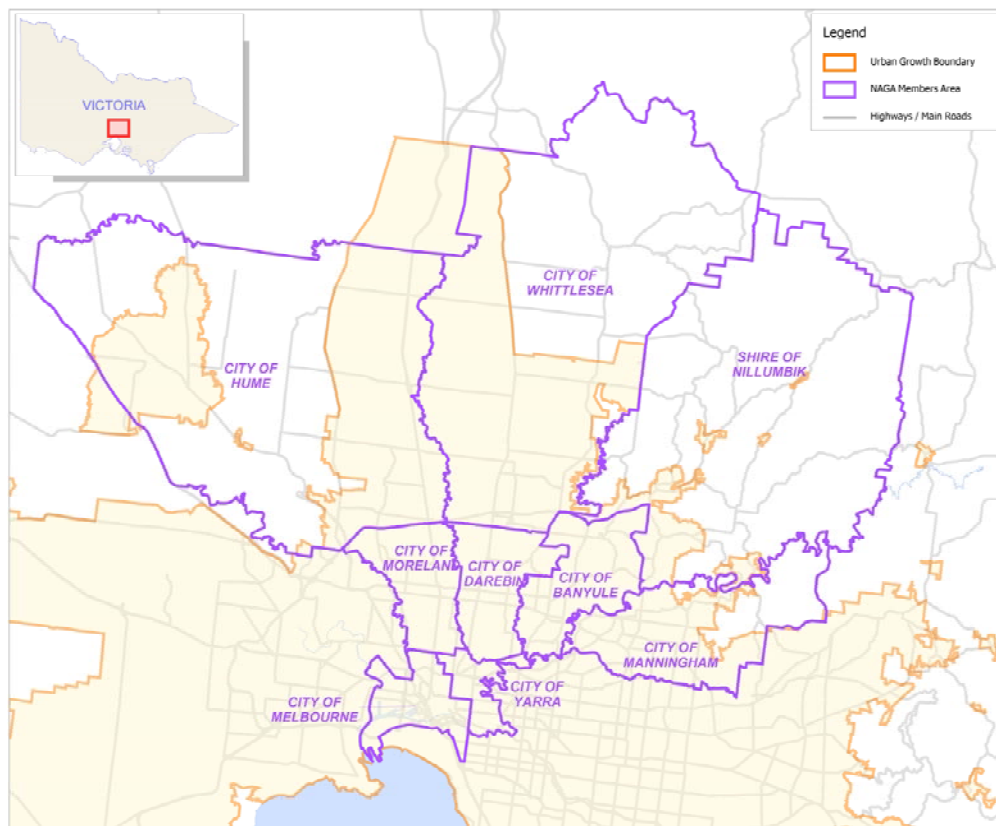
6.1.2 Northern Alliance for Greenhouse Action (NAGA)

As with other Victorian Greenhouse Alliances, the Northern Alliance for Greenhouse Action was formed in 2002. It consists of nine northern metropolitan Melbourne Councils and the Moreland Energy Foundation Limited. The Councils are:

- City of Banyule
- City of Darebin
- City of Hume
- City of Manningham
- City of Melbourne
- City of Moreland
- Shire of Nillumbik
- City of Whittlesea
- City of Yarra.

The geographic extent of the NAGA region is provided in Figure 15.

Figure 15: NAGA region



6.1.3 Resourcing

NAGA currently consists of one fulltime Alliance Coordinator supported by the resources of each of the NAGA members.

Initially, full time Alliance Coordinators were funded by the Department of Sustainability and Environment (DSE). This funding is now being withdrawn with the intention that alliances move towards a self funded model.

To manage and coordinate each of the strategies envisaged under Plan for Getting to Zero necessitates expanding the current level of NAGA resourcing both in time and finances. This is explored further in Section 7.

6.2 Vision

As articulated in the NAGA Strategic Plan the Vision for NAGA is:

Within five to ten years, communities within the NAGA region will be living more sustainably. There will have been a widespread move away from fossil fuels and greenhouse emissions will be decreasing significantly. There will be a strong sense of interconnectedness and a more localised economy with localised energy generation. The urban form will support more green spaces, biodiversity and locally produced food. Public transport, cycling and walking will be the preferred means of transport.

NAGA has identified its mission as:

The Northern Alliance for Greenhouse Action will be a robust and well regarded organisation that has played a key role in this shift. NAGA will have a broad network of strong alliances and will continue to foster positive change.

The Plan for Getting to Zero will not only guide the actions undertaken by NAGA it will also influence its role and form as an organisation.

It is important therefore that the Plan for Getting to Zero report be underpinned and align with the NAGA mission and Vision. This informs the framework on which this and individual NAGA Council carbon mitigation strategies can be developed and the basis on which the strategy can be implemented.

6.3 Current emissions profile

The NAGA region 2005/2006 carbon footprint and projections to 2020 reflect a typical urban and mixed-use profile. As shown in Table 16 the footprint is dominated by stationary energy emissions of which the largest contributors are the industrial and commercial sectors.

Transport is the next largest contributor to the regional profile with non-freight road transport being the most significant element. Projections to 2020 reflect regional household and population growth profiles. Total growth in emissions to 2020 is estimated to be approximately 18.8 per cent on 2005/2006 emissions.

Table 16: NAGA emissions by source

emission source	2005/06 emissions (kt CO ₂ -e)	2020 emissions (kt CO ₂ -e)	percentage change (%)	overall percentage (%)
stationary energy				
residential	3,608	4,893	35.6	17.1
commercial	5,510	6,877	24.8	26.2
industrial	5,904	6,150	4.2	28.0
services to transport	24	27	12.6	0.1
non-energy mining	399	456	14.3	1.9
agriculture	45	52	15.2	0.2
water	48	52	9.2	0.2
construction	46	56	20.8	0.2
non-freight road	2,472	2,829	14.5	11.7
freight road	1,215	1,574	29.6	5.8
commercial and industrial waste	708	830	17.2	3.4
municipal waste	232	273	17.6	1.1
public transport	609	671	10.1	2.9
rail freight	124	157	26.6	0.6
construction and demolition waste	50	57	13.6	0.2
agricultural	36	36	0.0	0.2
land-use change	12	12	0.0	0.1
waste water	10	11	15.3	0.0
Total	21,051	25,012	18.8%	100.0%

6.4 Emission Trends

Growth in emissions can be attributed to the growth in households and population predicted to take place between 2005/06 and 2020, as outlined in Table 17. During this time emissions per household are projected to decline, despite an overall rise in the per capita emissions due to the expected reduction in the number of persons per dwelling.

Table 17: NAGA emission trends

Factor	2005/06	2020
Residents (no.)	958,228	1,123,135
Residential emissions/resident (t CO ₂ -e)	3.7	4.4
Households (no.)	341,107	464,196
Residential emissions/household (t CO ₂ -e)	10.6	10.5
Commercial employees (no.)	458,010	536,935
Commercial emissions /commercial employee (t CO ₂ -e)	12.0	13.1

6.5 Plan for Getting to Zero

The Plan for Getting to Zero represents the contribution NAGA Councils, at a regional level, can make to carbon emission reductions. Achievement of zero net emissions will be contingent on the efforts of other levels of government, the private sector and community.

The duration of the Plan for Getting to Zero is from mid 2009 to the end of 2020. During this time there will be significant change in the regulatory environment surrounding the management of carbon, the values of society and in technology. To address these changes and ensure the currency of the Plan for Getting to Zero its focus is on specifying actions the NAGA Alliance Co-ordinator and NAGA Councils can take to progress each of the strategies and supporting initiatives in the three year period (mid 2009 to mid 2012) following its commencement.

6.5.1 Five Strategies

In planning to get to zero, a range of programs have been identified addressing five strategic areas:

1. Industrial
2. Commercial
3. Residential
4. Decarbonising the energy supply
5. Transport

6.5.2 Summary of Emissions by Strategy

Table 18 highlights the relative contribution to emission reduction each strategy represents as a percentage of the total emissions expected in 2020.

Table 18: Summary of Emission Reduction by Strategy

	Total projected emissions 2020	Potential emission reduction to 2020	
Strategy	25,012	5,463	21.84%
Industrial		1,873	7.5%
Industrial efficiency		688	2.8%
Industrial ecology		42	0.2%
Central services hubs		1,142	4.6%
Commercial		776	3.1%
Wholesale & retail and education & health efficiency program		678	2.7%
Wholesale & retail existing programs participation		3	0.0%
Health, education and large scale retail cogeneration		95	0.4%
Residential		1,317	5.3%
Existing built form		468	1.9%
Future built form		849	3.4%
Decarbonising energy		1,339	5.4%
Address industrial barriers to renewables			
Promotion of embedded renewables		1,339	
Transport		158	0.6%
Regional Cycling and Walking Strategy		55	0.2%
Community Transport Plan		71	0.3%
Electrical car network based on renewables		32	0.1%

6.6 Strategy Action across NAGA

Table 19 provides a guide to the applicability of each strategy to individual Councils across the NAGA region. It is noted a Plan for Getting to Zero is prepared as a regional strategy and provided to guide the implementation of individual council carbon mitigation strategies.

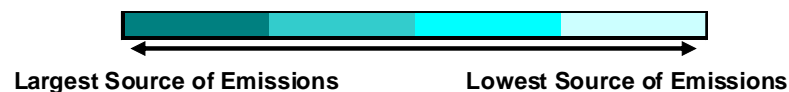
Recommended actions

Program	Description
Climate 2020	Governance: facilitate and support Councillor and/or executive participation in the NAGA executive committee
Strategic Transport Working Group	Transport: investigate if Manningham City Council will accept the role as lead council for the program, <i>Regional Cycling and Walking Strategy</i> , one of the key elements of the NAGA action plan - <i>Towards Zero Net Emissions</i>
Get ClimateWise Now!	Community Education and Capacity Building: investigate if Manningham City Council will accept the role as lead council for the program, <i>Existing Residential Built Form - Solar Homes - efficiency and de-carbonisation</i> , one of the key elements of the NAGA action plan - <i>Towards Zero Net Emissions</i>

Table 19: Summary of Strategy Application across NAGA Councils

Strategy	Relevant Councils								
	Banyule	Darebin	Hume	Melbourne	Manningham	Moreland	Nillumbik	Whittlesea	Yarra
Industrial									
Industrial efficiency	✓	✓	✓✓	✓✓	✓	✓✓	✓	✓✓	✓✓
Industrial ecology	✓	✓	✓✓	✓✓	✓	✓✓	✓	✓✓	✓✓
Central services hubs	✓	✓	✓✓	✓✓	✓	✓✓	✓	✓✓	✓✓
Commercial									
Wholesale & retail and education & health efficiency program	✓✓	✓✓	✓✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓
Wholesale & retail existing programs participation	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Health, education and large scale retail cogeneration									
Residential									
Existing built form	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Future built form	✓	✓	✓✓	✓	✓	✓	✓✓	✓✓	✓
Decarbonising energy									
Address industrial barriers to renewables									
Promotion of embedded renewables	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Transport									
Regional Cycling and Walking Strategy	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Community Transport Plan	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Electrical car network based on renewables	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓

✓✓	High Application	✓	Potential Application	-	Limited Application
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7 Context

The science is telling us we are heading for catastrophic climate change. Yet, even when the population at large is voting for change, demonstrated by the election of the Rudd Government, the inbuilt inertia of our political and economic systems leads to a failure to respond with the necessary haste in policy reform.

7.1 Stern report - economics of climate change

"Global warming is the greatest market failure of all time."

Nicholas Stern – former chief economist of the World Bank

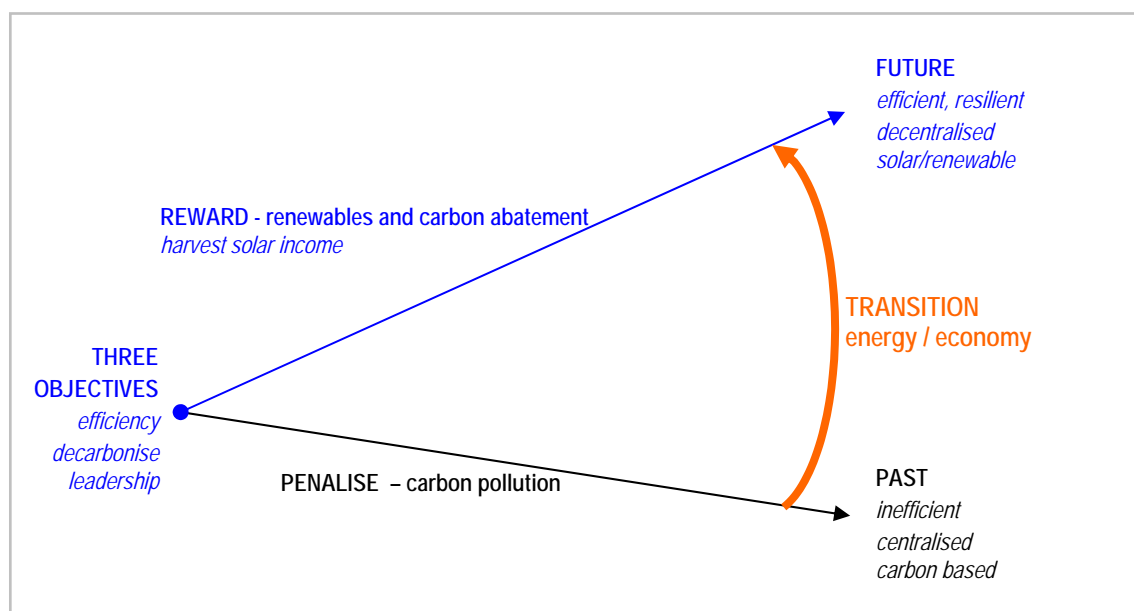
The *Stern Report* strongly recommends early action on climate change, otherwise costs will soar at a later date. It finds adopting the necessary policy response – carbon pricing, technology policy and energy efficiency – economies that restructure to take advantage of a low carbon world will prosper.

Stern acknowledges climate change requires action urgently if we are to avert irreversible damage to the ecosystem services on which life and civilisation as we know it depends.

7.2 Climate / Energy / Economy

Climate action is inextricably linked to energy and economic action because reducing our impact on climate systems relies on transitioning our energy and economic systems towards a future of efficient, decentralised and renewable energy.

Figure 16: The necessary transition of energy / economy systems guided by three objectives – efficiency, decarbonise, leadership



7.3 Inconsistent Policies

Inconsistencies in Federal Government policies relating to economic growth and climate abound. While one federal department negotiates greenhouse targets another arm of government, as a strategy to promote economic growth, commits to massive infrastructure investments in railways and ports to export coal. In contrast the Greens, unlike the mainstream political parties, have as a policy the withdrawal of the social licence to burn and/or export coal.



7.4 Safe Climate Target

Many leading scientists (e.g. John Schnellhuber, Jim Hansen) are now saying a target range of 300-325 ppm of CO₂ in the atmosphere is the only safe climate target. Only a return to preindustrial levels of CO₂ would be enough to guarantee a safe future for the planet. Even a small increase in temperature can trigger several climatic tipping points, such as methane release from melting permafrost, and bring more severe global warming. Anything above 300-325 ppm will not restore the planetary energy balance, retain the Arctic Sea ice, or prevent glacial melts.

Al Gore, former vice president of the United States, along with many others, believe adopting a climate emergency response is necessary to avert catastrophic climate change. For example, he is proposing 100 per cent decarbonisation of energy supply by 2020.

7.5 Urgent Action Required

Leading scientists believe we have less than seven years to reach 'peak' greenhouse emissions by 2016:

- < 2 degrees global warming to avert irreversible climate change
- Peak greenhouse by 2016 – two terms of government
- Stern and Garnaut Reports – early action otherwise costs will soar
- Business as usual no longer an option, nor preferable

7.6 Manningham City Council

Manningham City Council has a long history of commitment to climate change action. Since 1991 Council has actively worked to reduce energy use and improve efficiency within its Facilities Management area.

In 1998, Council endorsed *GreenPrint for a Sustainable City* with five stretch goals:

1. Zero climate damage
2. Zero extinctions
3. Zero pollution
4. Zero soil degradation
5. Zero waste

In 1998, Council also committed to *ICLEI's Cities for Climate Protection* program. By February 2001 Council adopted the Local Action Plan for Zero Climate Change with a commitment to achieving an operations target to stabilise emissions to 80 per cent of 1996 levels by 2010.

Council achieved its CCP target largely through the purchase of GreenPower.

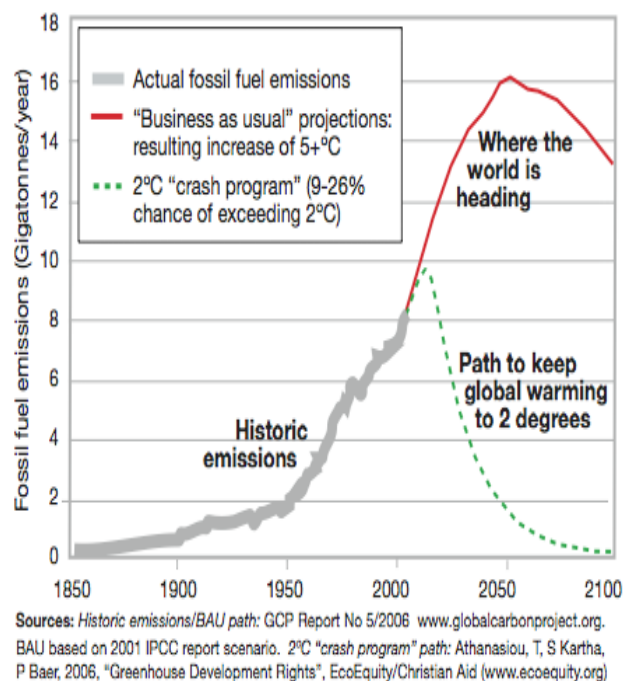


Figure 17: World Peak Greenhouse Emissions by 2016

7.7 Role of Local Government

"Climate change is the greatest social, economic and environmental challenge that Victoria, Australia and the world is facing. . . . the implications of this will result in local government being at the 'coal face' of managing the impacts of climate change and providing leadership for the broader community. This responsibility will require Councils to continue to implement mitigation strategies and adapt their activities and resource allocation to address challenges, potentially at a considerable cost to the sector. Victorian Councils have recognised climate change is one of the top three issues of concern for local government.

The local government sector also believes that with this crisis, comes opportunity. Opportunities may exist in the form of economic development within a "climate change economy", particularly in regional areas. This could be in the form of research and development, land management for carbon sequestration and biodiversity outcomes, and decentralised renewable energy production. Acting quickly and substantively on climate change will help to ensure these opportunities are not lost. Local government can help the State Government harness these opportunities, through its direct contact with communities, detailed local knowledge and an understanding of the need for practical change."

MAV consultation draft submission: Climate Change Summit Discussion Paper – June 2008

7.8 Policy Context

A summary of policy at all spheres of government is provided in Table 20.

Table 20: Summary of policy context

Strategy/Policy	Sphere	Comment
World Summit 1992 - Rio de Janeiro	International	<i>Thinking globally, acting locally</i> through two initiatives: Local Agenda 21 – strives to conserve biodiversity; and Cities for Climate Protection – strives to reduce global warming.
Kyoto Protocol Dec 1997	International	Commits developed countries to reduce their collective emissions of six greenhouse gases by at least five per cent of 1990 levels by 2012. The Kyoto agreement became legally binding on 16 February 2005 when 132 signatory countries agreed to strive to decrease carbon dioxide emissions. Australia became a signatory in December 2007.
Australia's Kyoto agreement ratified Dec2007	International	Currently on track to achieve its 2012 target of 108 per cent on 1990 levels
Copenhagen, December 2009	International	Negotiations for post 2012 greenhouse gas mitigation targets
Stern Report - 2007	Britain	<i>"Global warming is the greatest market failure of all time."</i> Nicholas Stern – former chief economist of the World Bank The Stern Report strongly recommends early action on climate change otherwise costs will soar at a later date. By adopting the necessary policy response – carbon pricing, technology policy and energy efficiency - economies that restructure to take advantage of a low carbon world will prosper.
Garnaut Review - late 2008	Australia	Similar to the Stern Report recommends early action to avoid economic costs – prefers global effort to achieve of 450ppm / 2050 -25% / 2020, 90% / 2050. However, it has set 'politically' realistic goal, but acknowledges inadequacy, of 550ppm / 2050 – 10% / 2020, 80% / 2050 (baseline 2000)
Climate white paper – Wong – mid 2009	Australia	In absence of international agreement, 5% / 2020; with international agreements 15% / 2020, 60% / 2050 (baseline 2000) – totally inadequate targets when climate science considered - 350ppm by 2050, 5% / 2020, 100% / 2050
Carbon Pollution Reduction Scheme to be presented to Senate in mid 2009	Australia	Commences early 2010
Victorian Renewable Energy Target (VRET)	State	A market based measure to ensure the Government meets its commitment to achieve 10 per cent of electricity consumption from renewable energy sources in Victoria. VRET will continue until 2030, providing long term support for the renewable energy industry in Victoria and reducing greenhouse gas emission by 27 million tonnes over this period.
Victorian Energy Efficiency Target (VEET) (Dec 2007)	State Government	Commences January 2009 Targets energy savings in residential sector. It aims to help families reduce energy bills by requiring energy retailers to meet their own targets through energy efficiency activities, such as providing householders with energy saving products and services at little or no cost. The VEET scheme will play a role in achieving the State Government's target of reducing emissions from households by 10 per cent by 2010.

Strategy/Policy	Sphere	Comment
Targets for State Government operations	State Government	5-star environmental ratings for all new buildings 20% reduction in GHG 10% GreenPower \$500,000 pa invested in offsets GreenStar rating for all major buildings 150 hybrid vehicles
Feed-in-tariff	Germany, some Australian states	In Germany gross feed-in-tariffs are uncapped and unrestricted. Available to business and households, ranging from a factor of 8 to 20, drive decarbonisation of energy supply, generate new 'green' jobs, and revitalise rural economies. By comparison, feed-in-tariffs proposed in Australian states are typically 'nett' feed-in-tariffs, ranging from a factor of 2 to 4, restricted to households, and capped at 2Kw. They're inadequate to drive distributed renewable energy generation, new employment and business opportunities or decarbonisation of energy system.
NAGA – Towards Zero Net Emissions - a regional action plan (June 2009)	Regional	Facilitates regional action and advocacy with greater involvement of member councils at executive and Councillor level.
Cities for Climate Protection Local Action Plan (2001)	Manningham	Commenced 1998, Manningham has completed 5 milestones. Climate 2020 will replace this action plan.
GreenPrint (1998)	Manningham	Endorsed by Council in 1998, it includes stretch goals of zero climate damage, extinction, pollution, soil degradation and waste.
Doncaster Hill Smart Energy Zone Action Plan (August 2009)	Manningham	Partly funded by Sustainability Victoria it aims to establish Doncaster Hill and the Civic Precinct as leading examples of local energy generation, decarbonisation of energy supply, efficiency and leadership
Manningham's Environmental Sustainability Environmental Priority Statement (July 2007)	Manningham	Part of the Sustainability Accord process between state and local government, it identifies three priority projects: (1) establishment of a biodiversity regional action group; (2) greening Council's own buildings; and (3) neighbourhood planning for Doncaster Hill
Accelerating Sustainable Building in the Local Government Sector (Septemeber 2008 to December 2009)	Local Government	Local government is one of the few remaining sectors, along with state and federal governments, that still builds, owns and operates its own building portfolio. Hence it is well positioned to demonstrate leadership and this initiative aims to foster this Vision.

8 Consultation

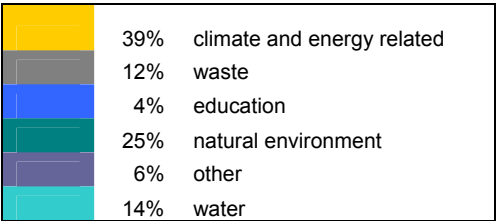
From mid 2007 and throughout 2008 community consultation was undertaken. This Chapter provides a summary of the consultation and its findings.

8.1 Manningham Matters Environmental Survey - July and August 2007

Through Council's community newsletter, *Manningham Matters*, residents were invited to complete an environment survey designed to allow them to raise concerns about the environment and evaluate Council's performance in regards to environmental sustainability issues. Conducted in late July and early August of 2007, a total of 351 residents returned the survey by the deadline.

Asked to rate their five most important environmental sustainability issues, residents nominated those relating to climate and energy, natural environment, water and waste as their top priorities (Table 21).

Table 21: Summary of Priority Issues for Residents – refer Figure 18



The graph below expands on these categories to identify each specific issue. 'Water conservation' was the most selected issue with 250 responses followed by 'waste minimisation' with 200 responses.

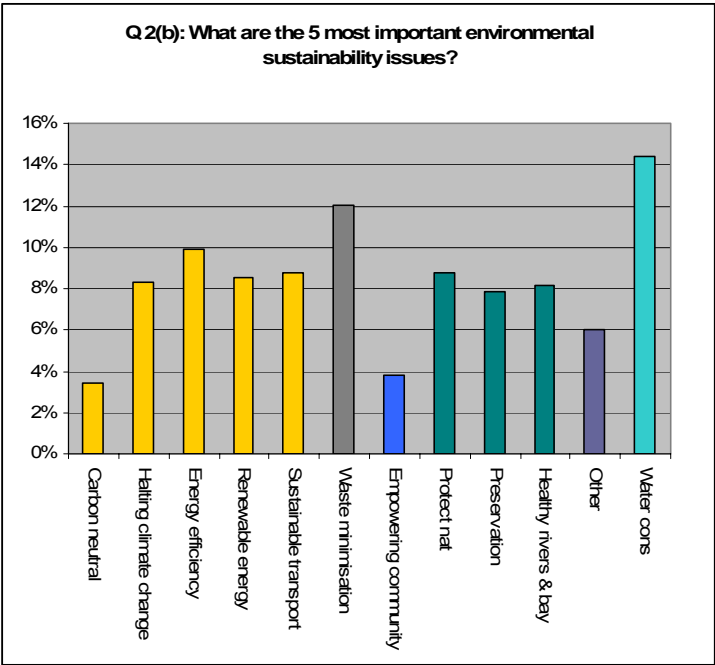


Figure 18: The five most important environmental sustainability issues as nominated by residents

Given a selection of sustainability priorities, residents ranked 'educating the community about sustainability issues and solutions' as the most important priority for the Manningham community.

Sustainability Priority	Rank
educating the community on sustainability issues and solutions	1
improving the sustainability of current Council services	2
managing Council assets in a sustainable manner	3
community engagement and empowerment (including residents, businesses)	4
advocating to other governments, on behalf of the community, for improved sustainability outcomes	5

8.2 Stretch Goals – Moving Beyond Business as Usual

Stretch goals are ambitious, long term goals used to inspire creativity and innovation to achieve outcomes that currently seem impossible. You cannot achieve stretch goals with a business as usual approach.

Four stretch goals were adopted through the Climate 2020 consultation process with staff and community and used back casting as a means to generate innovative responses to climate change.

Stretch Goals

0%	zero net greenhouse emissions
100%	renewable energy
↑ 20%	local renewable energy generation and increasing
20%	more energy efficient



8.3 Common Threads

Through Climate 2020 consultation participants identified a number of common threads.

TRANSPORT	HOUSING	COMMUNITY
how can we improve our public transport – public and private	residential houses – efficient energy lifestyle	how do we make our neighborhood green
transport – reinvent how we access	reducing household emissions	change in community mindset
clean air and water	energy smart buildings	creating shared community
		create local work opportunities
		green parks – enough water diversion

8.4 Proposed Programs – Community

Climate 2020 consultation participants identified the following programs to deliver the Climate 2020 Vision for Manningham.

Transport

1. Advocate for integrated Public Transport (rail, tram and bus)
2. Effective Bus Transit system (i.e. frequent and wide coverage)
3. Bus 'n Ride not Park 'n Ride
4. Community bus
5. Encourage green car sales through local dealers
6. Effective bike network



Housing and Buildings

7. Advocate for adequate feed-in-tariff for renewable energy generation
8. Energy smart houses and buildings (i.e. encourage good design)
9. Advocate for mandatory disclosure of energy performance at sale or lease
10. Development of sustainable and higher density activity centres

Community and economy

11. CRAGs – group purchase of solar electric panels, solar hot water, insulation, etc
12. Get ClimateWise Now! workshops
13. EcoFootprints – monitoring our progress in the Annual Report
14. Green Business Incubator - thriving local 'new' economy creates local work opportunities

8.5 Leadership – Council Leads the Way

Recognising the import role Council plays in demonstrating leadership, the following programs were proposed for Council operations and service delivery.

Buildings

1. Energy smart buildings
2. Sustainable retrofit program
3. All new buildings to be 6 star or better – and carbon neutral
4. GreenPower for community and Council buildings

Street Lighting (60% GHG)

5. Changeover to energy efficient lights

Energy

6. Smart Energy Zone for Doncaster Hill
7. Iconic energy project for Civic Precinct (e.g. embedded PV in new bus station and walkways)
8. Explore renewable energy generation (e.g. wind power at the depot, geo thermal for Doncaster Hill)

Vehicles and Transport

9. Trial bio-diesel for Council depot vehicles – algae based from coal fired power generation
10. Waste trucks – use of biodiesel and other fuel efficient technologies
11. Green Travel program for staff commuters
12. Bus travel encouraged for meetings in the city
13. Collaboration with Ventura Bus company

Tracking Our Progress

14. EcoFootprints – monitoring and reporting in the annual report



8.6 Community Vision – ClimateWise by 2020

As a result of the Climate 2020 consultation process, the following framework was identified to inform the development of the Climate 2020 Action Plan.

Theme	Objective
Community	Strong, informed, capable, resilient and willing
Environment <i>cool, green and natural</i>	Manningham protects and enhances its natural environment; values trees for cooling and shade – nature's air conditioner; lessens heat island' effects by reducing impermeable surfaces.
Thriving local 'new' economy	Innovative businesses providing world class sustainable products and services with plenty of local jobs
Transport – <i>on the move</i>	Live, work, learn and play locally; walk and cycle often; otherwise carbon neutral mobility – whether it be effective and innovative public transport systems or green electric cars
Houses and Buildings <i>small ecofootprints</i>	Carbon neutral – small ecological footprints; sustainable urban development and planning
Energy / Water / Food / Waste <i>smart and secure</i>	<p>Energy: efficient, generating significant renewable energy locally backed up by buying green energy</p> <p>Water: efficient, harvesting and re-used in laundries, toilets and gardens; low water gardens; healthy rivers; lawns replaced</p> <p>Food: locally or home grown and cooked, more farmers market, less food miles, reduced meat in diets</p> <p>Waste: minimise waste to landfill, reuse, reduce and recycle</p>
Leadership, Innovation and Learning	Council leads the way

9 Community *Energy and Greenhouse Profile*

It often surprises those not involved in climate action to find useful, timely energy data at a postcode, community, or regional scale is not readily available. In comparison, data is readily available for the water sector largely because it has not been privatised. Unlike the water sector, energy production in Victoria is now privatised and unfortunately energy organisations are reluctant to release information due to commercial confidentiality.

For these reasons, Manningham City Council has relied on two research projects to derive methodologies to estimate energy and/or greenhouse profiles for the municipality.

1. NAGA Towards Zero Net Emissions
2. RMIT Carbon Neutral Communities

Both estimations are broadly in agreement and form the foundation on which baselines and targets are formulated for the Climate 2020 Action Plan.

9.1 NAGA Towards Zero Net Emissions

Emissions within Manningham are primarily from the residential sector, representing 40 per cent. Non freight road is the next largest contributing sector at 27 per cent, followed by stationary commercial emissions at 17 per cent.

Community GHG Profile	2005/06	2005/06	2020	2020
Stationary energy	kt CO2-e	%	kt CO2-e	%
Residential	483	40	648	44
Commercial	209	17	244	17
Manufacturing	66	5	64	4
Services to transport	0	0	0	0
Non-energy mining	9	1	14	1
Agriculture	3	0	3	0
Water	1	0	1	0
Construction	4	0	5	0
Non-freight road	329	27	375	25
Commercial and industrial waste	43	4	49	3
Municipal waste	25	2	29	2
Public transport	21	2	23	2
Freight road	16	1	13	1
Rail freight	5	0	6	0
Construction and demolition waste	4	0	5	0
Land-use change	1	0	1	0
Waste water	1	0	1	0
Agricultural	0	0	0	0
Total	1220	100	1481	100
		%increase cf 2005/06	21%	

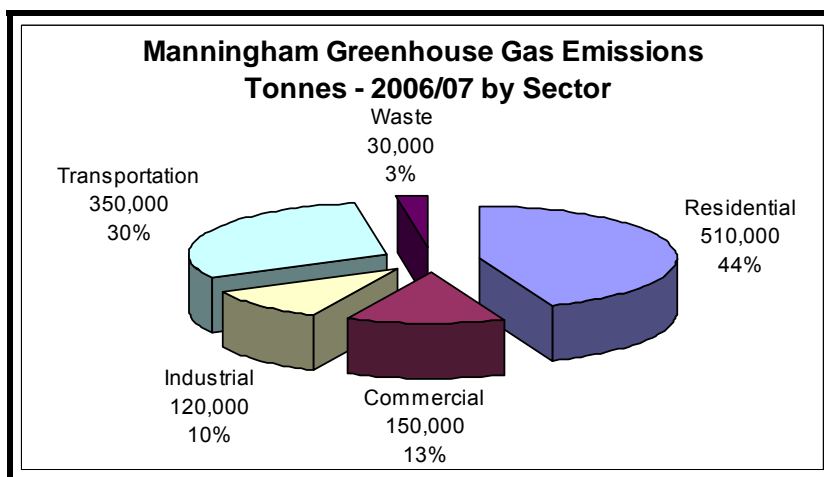
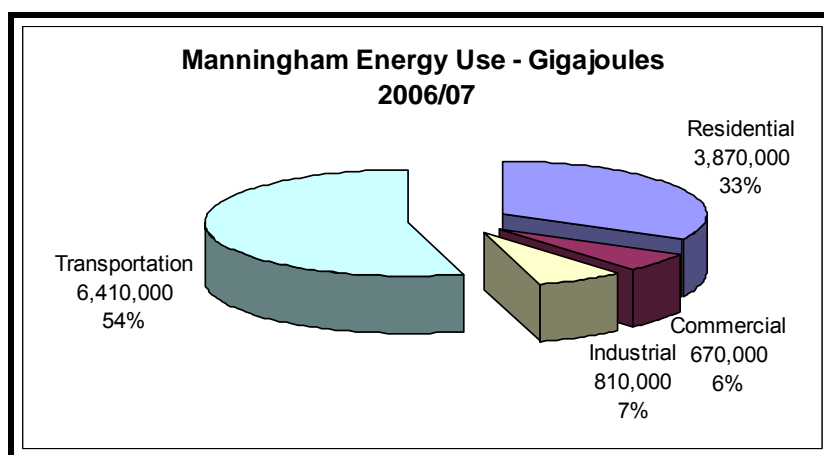
The relative contribution from residential emissions is forecast to increase by 2020 to 44 per cent. There will be slight decreases in the percentage contribution from non freight road and stationary commercial emissions.

Total emissions from 2005/06 to 2020 are set to increase from 1,220.5 kt CO2-e to 1,480.2 kt CO2-e.

9.2 RMIT Carbon Neutral Communities

In addition to greenhouse profiles by sector, the RMIT data provides information on energy use.

Sector	GHG Tonnes	% GHG Tonnes	Energy GJ	% Energy GJ
Transport	350,000	30%	6,410,000	54%
Residential	510,000	44%	3,870,000	33%
Commercial / industrial	270,000	23%	1,480,000	13%
Household waste	30,000	3%	-	-
Total	1,160,000		11,760,000	



10 Efficiency *Reducing Energy Demand*

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, 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

10.1 Residential Strategies

The two graphs below show the distribution of energy consumption across a sample of 51 Manningham households. The sample covers smaller house sizes, from 5 to 15 squares (equivalent to about 140m²).

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

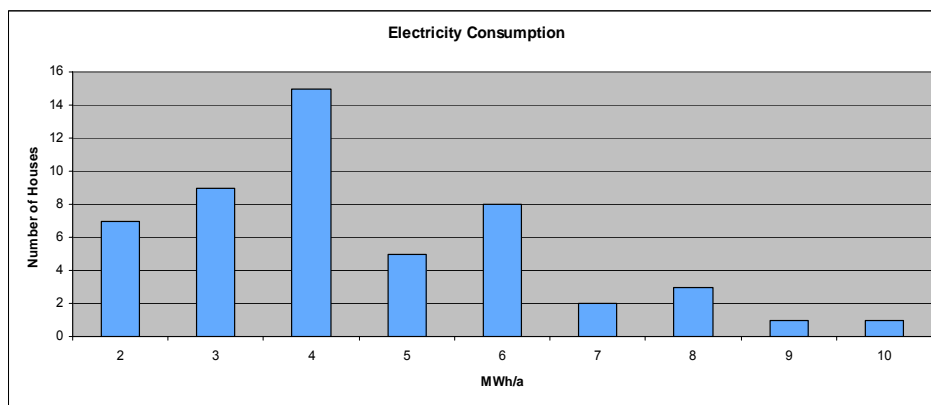


Figure 19: Average Electricity Consumption Comparison

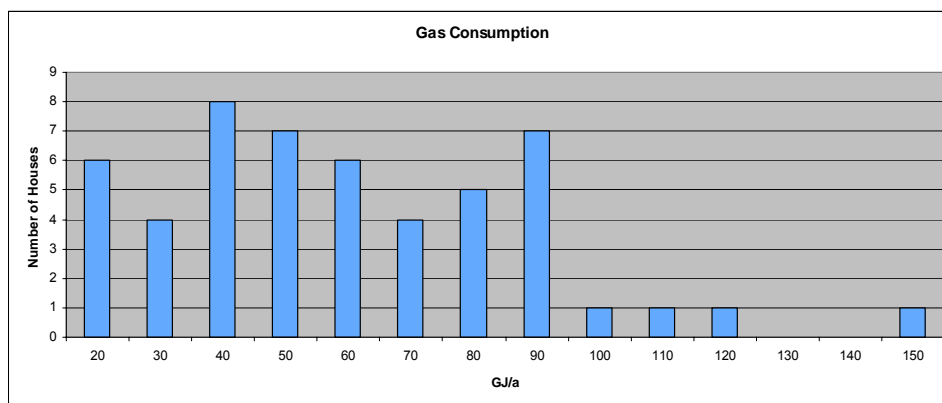


Figure 20: Average Gas Consumption Comparison

The wide spread in consumption detailed in Figures 19 and 20 indicates a large influence of occupant behaviour in selecting and operating energy consuming devices. This includes indirect measures such as closing doors, blinds, curtains, hot water taps, etc.

We suggest 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.

10.1.1 Lighting

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

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

10.1.2 Building Rating Tools

The Council could make certain ratings mandatory for multi-residential buildings (e.g. 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 such as lighting.

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

10.1.3 Solar Neighbourhoods – Residential Bulk Purchase Programs

Manningham City Council, on behalf of its residents, has successfully co-ordinated two bulk purchase programs: (1) 1 kW photo voltaic panels; and (2) solar hot water systems. This program is self funding. Minor bulk purchase programs have been delivered through the Get Climate Wise program for insulation and solar space heating. Future programs will continue to be rolled out.

10.1.4 Educational Programs

Energy can often easily be saved by small things like turning the lights off or buying better equipment. The Council increases community awareness, knowledge and capacity through a number of existing educational programs. 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. Such programs could include:

- Get ClimateWise now! workshops series – a mixture of vendor and educational presentations
- Climate Rationing Action Groups – a 10 month program where households calculate their 'carbon footprint', then establish their individual carbon 'ration' and action plan to live within their goal

10.1.5 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

10.2 Commercial and Retail Strategies

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

10.2.1 Improve Building Design and HVAC Systems

The dominant energy consumers are HVAC (heating, cooling and ventilation) and lighting. Good building design can reduce predominantly 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 enable opportunities for natural ventilation, in turn, this could reduce 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.

10.2.2 Building Rating Tools

By making certain ratings mandatory (e.g. GreenStar Office Tool v3) for building permits, the 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 their own rating tool outlining desired the 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 and thus trigger innovation.

10.2.3 Using Modern Services Technologies

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

10.2.4 Educational Programs

As mentioned earlier, the actual energy consumption of offices depends to a notable degree on the building operation. Educational programs can help inform building owner and tenants on how to reduce their energy consumption, and the related costs and GHG emissions, by operating lighting, equipment and HVAC systems in a clever way. Furthermore the programs could provide businesses with up to date information on efficient equipment and services, and on 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

10.2.5 Green Business Catalyst 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. Furthermore they could be a contact point for other companies seeking to improve their efficiency.

10.2.6 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

11 Decarbonising *Embracing Alternative and Renewable Energy Sources*

Our current energy supply system is based on carbon based fossil fuels releasing greenhouse gases into the atmosphere only to result in global warming. Yet there are an abundance of alternative renewable energy technologies, capable of producing adequate base load, and/or energy at source of demand.

Decarbonising our energy supply systems, rapidly is the only truly effective way to avert catastrophic climate change.

It is recommended a number of decarbonisation strategies be adopted:

- Promote and support the installation of alternative and renewable technologies at a household level
- Promote and facilitate the rapid adoption of renewable energy / GreenPower
- Promote and facilitate the adoption of distributed energy generation, especially by the commercial and retail sector.

11.1 Carbon Neutral Communities

The term *carbon* is a short form common term for greenhouse gas.

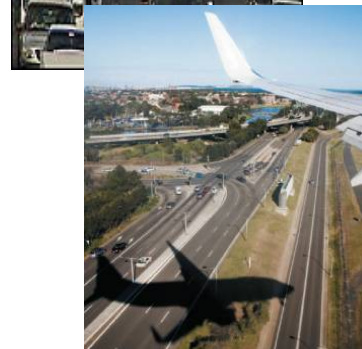
Greenhouse gas emissions from fossil fuel used across all sectors, land clearing, wastes in landfill and waste waters, and also a by-product of some industrial processes

Definition: carbon neutral community

A community that has zero net greenhouse gas emissions

11.2 Manningham's Renewable Energy Potential

Manningham City Council is participating in a Carbon Neutral Communities research project with the RMIT Centre for Design. As part of this project, a renewable energy assessment of the municipality was undertaken. The purpose of this assessment is to determine how much of the municipality's total energy requirements could be met by local energy generation. The assessment determined 100 per cent of all energy requirements, including power for vehicles, could be met by local generation.



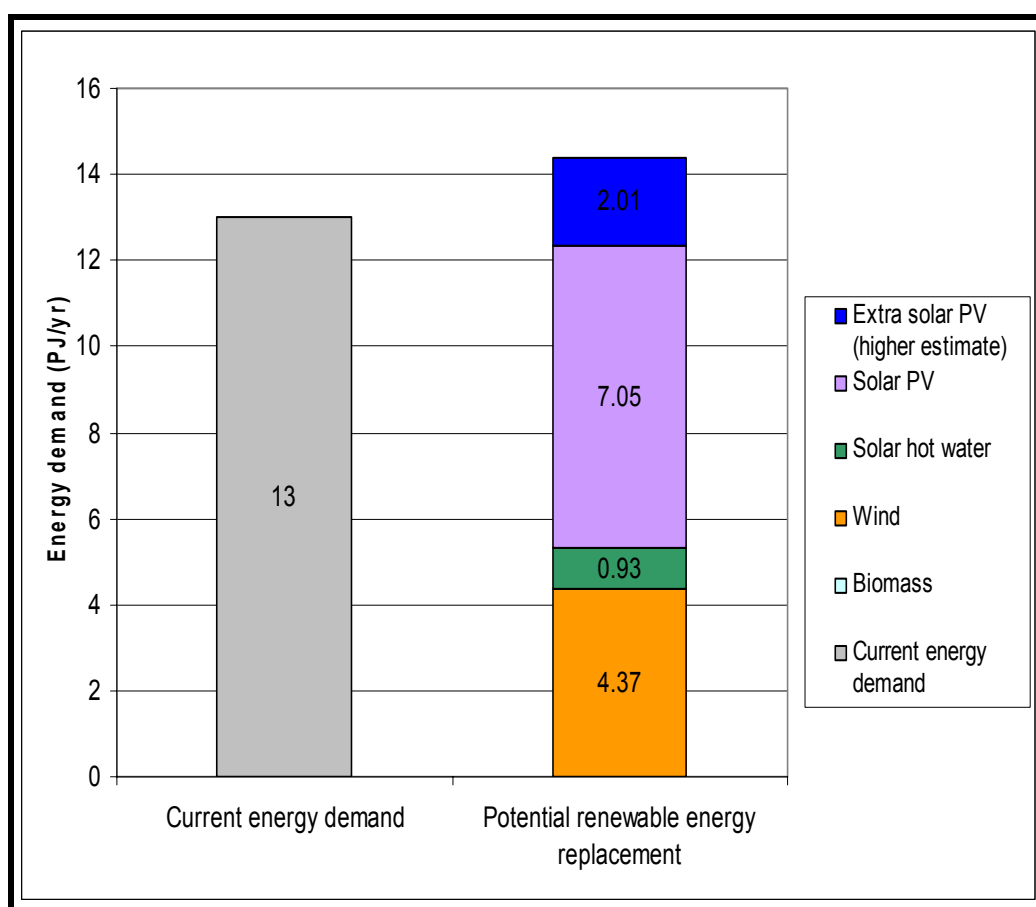


Figure 21: Renewable Energy Potential for Manningham

Key points

The renewable energy resource potential assessment for Manningham local government authority (LGA):

- Currently Manningham LGA produces approximately 11.5 per cent more greenhouse pollutants per person than the Victorian average and 16.5 per cent more than the national average
- Sufficient renewable energy resource potential exists (i.e. what can be collected using current technologies considered in this assessment) to meet between 95 and 110 per cent of Manningham LGA's total current energy demand (Figure 21). Trends in energy efficiency improvements, population growth, economic structure and economic growth could influence the final energy requirements
- If all renewable energy from Figure 21 were implemented then 4.3 Mt of carbon emissions would be saved each year (three times as much as is currently produced)
- Solar photovoltaics and hot water systems provide the potential to meet between 61 and 77 per cent of Manningham LGA's total current energy demand
- Wind turbines provide the potential to meet 34 per cent of Manningham LGA's current energy demand
- 41 per cent of current total energy demand can be provided by renewable energy resources in a financially viable way (seven per cent SHWS, 34 per cent wind))
- Solar hot water systems, small wind turbines and biomass are currently economically viable, however, solar photovoltaics are not currently economically viable without extra rebates

11.3 Climate / Energy / Economy

Climate action is inextricably linked to energy and economic action, as clearly demonstrated by the *Stern Report* and *Garnaut Review*.

Reducing our impact on climate systems relies on reorientating our energy and economic systems towards a future of efficient, decentralised and renewable energy.

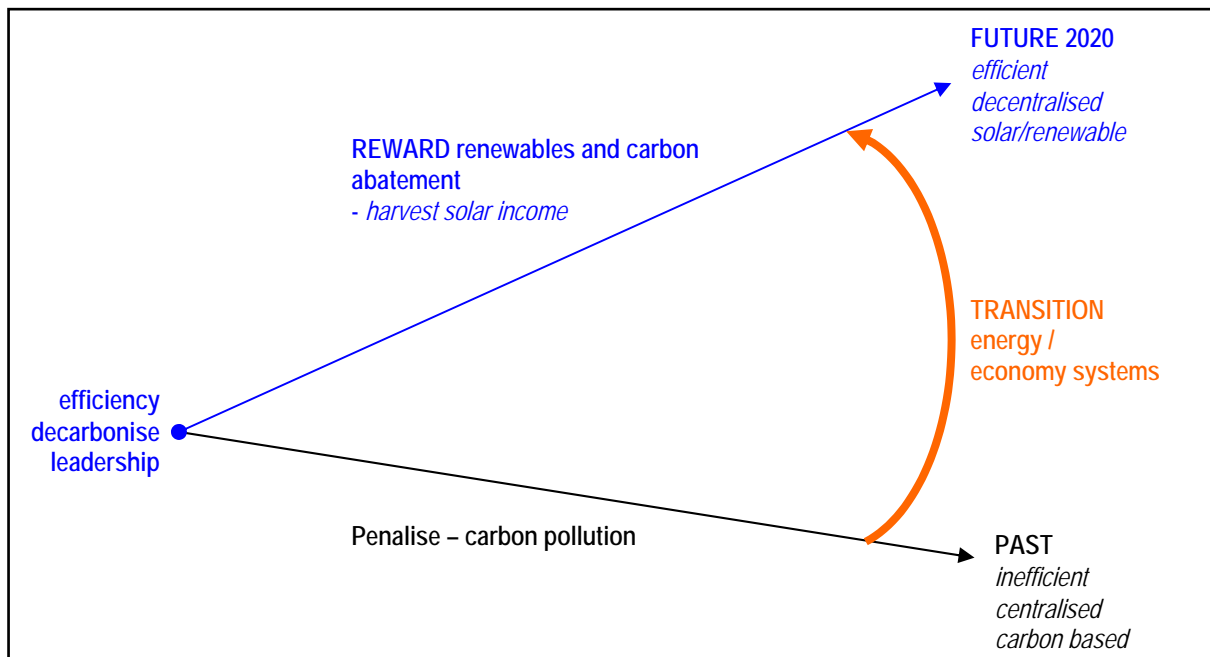


Figure 22: Climate 2020 / Energy 2020 / Economy 2020

Climate 2020 is the key implementation tool for community and Council action to enable each of us to contribute to closing the energy/economy gap and creating the necessary reorientation for a sustainable future. Climate 2020 shows how each of us, guided by the three objectives – efficiency, decarbonise and leadership – can through our choices and actions, no matter how small, accelerate the change already begun.

11.4 Alternative Energy Sources

There is a range of alternative energy technologies with the potential for widespread or decentralised application in Manningham. The following Sections provide a summary of potential alternative energy sources and case studies.

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 anticipated development types
- Feasibility in terms of cost and benefit
- Most suitable situations for their installation



11.4.1 Solar Photovoltaic (PV)

Photovoltaic systems (PV) consist of 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 to 30 years. However, the capital costs are high, with typical paybacks of 25 to 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 and may decrease development consolidation opportunities and, 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 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), which reduced household demand by 15 per cent.

Implementation:

- Attain information on the various rebates by 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

11.4.2 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 to 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 for their inclusion 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, consideration of mandating the use of solar hot water in multi-residential dwellings.

11.4.3 Solar Thermal

Solar thermal applications use solar energy to supply tempered ventilation air to reduce the total heating load of a building. The technology is most readily applicable to buildings with large heating loads and high outside air requirements. Retail supermarkets, for example, present an ideal opportunity for the application of solar thermal heating.

The cost of solar thermal is lower in new buildings when integrated with the façade and is the order of \$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 in the order 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.

11.4.4 Wind

Wind turbines use the kinetic energy of the wind. The type of turbines, horizontal or vertical, also has 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 efficiencies.

The efficiency of wind turbines is increased as wind speed increases. Hence, the wind turbines normally need to sit as high as possible above the ground; when the height above the ground increases the wind speed increases. However, it should be practical and cost effective. The typical tower a domestic wind turbine sits on is between 10 and 20 metres.



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.

The average capacity factor for wind turbines is 30 per cent, according to Australian Wind Energy Association. 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 micro wind turbine 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

11.4.5 Biomass

Biogas is generated by 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 which 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 combined energy and heat as a means of reducing costly and environmentally harmful waste to landfill could be investigated as a precinct wide compost to energy strategy. There are currently no similar uses of this technology in Australia for urban developments, 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)

11.4.6 Co- and Tri-generation

Centralised power plants have a very low efficiency especially due to losses within the grid and wasted heat. The overall efficiency from fuel to power-at-household is in the order of 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 come in sizes 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 in the order of \$3,000 per kW installed¹, will come down further in the near future.



Absorption chillers can also be added to the system to convert 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 due to using electricity from natural gas instead from the grid is in the order of 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 could be 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.

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.

11.5 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 customer's options to limit their greenhouse gas emissions impact. Generally non-accredited products are sourced from renewable energy and 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

¹ Soares C, *Microturbines: Applications for Distributed Energy Systems*, Butterworth-Heinemann, 2007

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 10%, 20%, 25%, 50%, 75% and 100% accredited GreenPower depending on what is offered by the energy retailer.

Implementation:

- GreenPower is immediately available and its uptake should be encouraged in the short term
- In the long term, renewable energy projects to be strongly encouraged.

11.6 Comparison of Renewable Energy Types

The following outlines a comparison of indicative cost implications and the likely payback period expected with each of the 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 nor the likely physical space requirements for each of the technologies outlined below as there are a number of influencing factors, including 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

11.7 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 100kilowatts including wind, hydro and biomass. (Source: DPI, Energy in Victoria).

The following explains the difference between gross feed in tariffs as compared to net feed-in-tariffs.

- **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>

Appendices

Appendix 1	Climate 2020 Programs and Budgets
Appendix 2	Climate 2020 Implementation Plan
Appendix 3	Program Briefs - Climate 2020
Appendix 4	Program Briefs - Doncaster Hill Smart Energy Zone

Appendix 1: Climate 2020 programs and budgets

Table 22: Community - supporting strong, informed, capable, resilient and willing communities

Program	Details	Strategy	Funding	2009/ 10	2010/ 11	2011/ 12
Get ClimateWise Now!	Increased capacity to deliver climate and energy action programs to the community. It includes such programs as Get Climate Wise Now! workshops, Carbon Rationing Action Groups (CRAGs) and LESS free installation of energy efficient lights and showerheads	Community Operational Performance	Climate 2020 Refer (1)	\$38,000	\$38,000	\$38,000
Solar Homes (self funded)	Increased capacity to facilitate residential group purchase of sustainable household technologies thereby increasing household level resilience and micro infrastructure	Community	Self Funded	-	-	-
Community Environmental Education	Continue to design and deliver environmental sustainability programs with a particular focus on waterways health, sustainable living, youth leadership and healthy horse pasture management	Community	Existing	-	-	-
Green Wedge Strategy	Working closely with the community to protect Manningham's natural environment for now and future generations	Environment <i>cool, green and natural</i>	Existing	-	-	-
Investment motivated through Climate 2020 Action Plan			Total	\$38,000	\$38,000	\$38,000

(1) This program is supported through the Climate and Energy Action Planning project: 2007/08 allocated \$33,000 and 2008/09 allocated \$35,000; this funding ceases 30/6/09. Ongoing support will continue if the Get ClimateWise Now! and SEZ programs are funded

Table 23: Fostering Sustainable Urban Development - Doncaster Hill Smart Energy Zone (SEZ) Action Plan

Program	Details	Strategy	Funding	2009/ 10	2010/ 11	2011/ 12
Smart Energy Zone	Increased capacity to promote, advocate and facilitate more sustainable urban development with regard to energy demand, distributed energy generation, building performance, metering and monitoring, and attract external funding	Governance	SEZ Action Plan	\$38,000	\$38,000	\$38,000
Accelerating Sustainable Building	Increased capacity to drive sustainable building and urban development on Doncaster Hill, for major developments and across Council Capital Works, and attracting external funding	Sustainable Urban Development and Planning	SEZ Action Plan	\$42,000	\$42,000	\$42,000
Green Business Catalyst	Increased capacity to promote sustainable business practices, attract/create innovative 'new' green economy businesses, form strategic partnerships, generate new jobs, and attract funding	Local Economy	SEZ Action Plan	\$30,000	-	-
Investment motivated through Doncaster Hill Smart Energy Zone Action Plan			Total	\$110,000	\$80,000	80,000

Appendix 1: Climate 2020 programs and budgets

Table 24: Leadership - Improving Council's Operational Performance

Program	Description	Strategy	Funding	2009/ 10	2010/ 11	2011/ 12
Climate 2020	Increased capacity to respond to the challenges of energy efficiency, decarbonising our energy system, adapting to climate change, attracting external funding, and participation in NAGA regional alliance	Governance	Climate 2020	\$10,000	\$10,000	\$10,000
Energy Smart	Increased capacity to investigate and implement local energy generation solutions to meet Council's own energy needs, deliver energy efficient lighting, and attract external funding	Leadership Operational Performance	Refer (2)	-	-	-
Sustainable Building Operation	Increased capacity for Council to deliver energy efficient buildings through effective retrofits, proactive energy management, benchmarking and to attract external funding	Leadership Operational Performance	IAARS Refer (3)	-	-	-
GOGO	Continue to develop the necessary organisational culture, knowledge and skills to deliver improved sustainability performance	Education and Capacity Building Leadership	Existing	-	-	-
SHE Q RMS	An integrated approach to safety, health, environment and quality risk management	Governance Operational Performance	Existing	-	-	-
Ecofootprint System	Increased capacity to proactively drive Council's environmental performance improvement, develop the necessary tools supporting proactive energy management, benchmarking, and diagnostics, monitoring, and reporting through EcoTracker	Education and Capacity Building Leadership Operational Performance	Refer (1) and (4)	\$21,000	\$21,000	\$21,000
investment motivated through Climate 2020 Action Plan			Total	\$31,000	\$31,000	\$31,000

(1) This program is supported through the Climate and Energy Action Planning project: 2007/08 allocated \$33,000 and 2008/09 allocated \$35,000. This funding ceases 30/6/09. Ongoing support will continue if the Get ClimateWise Now! and SEZ programs are funded

(2) Allocation for Energy Smart program to be motivated through capital works such as. sustainable public lighting project and other relevant projects (estimate \$38,000)

(3) Allocation for the Sustainable Building Operation program to be motivated as part of IAARS capital works program (estimate \$35,000)

(4) The Ecofootprint System has been allocated \$21,000 in 2007/08 and 2008/09

Appendix 2: Climate 2020 implementation plan

Strategy					
No.	Program	Action	2009/10	2010/11	2011/12
1. Community - Education and Capacity Building					
1.1	Community Environmental Education	Continue promotion of urban food production and replacement of lawns through household and community gardening workshops	Ongoing	Ongoing	Ongoing
1.2	Community Environmental Education	Continue promotion of smart and secure lifestyles with regard to energy/water/food/waste and the importance of valuing the health of natural systems by protecting and conserving: habitats, soils, waterways, fauna and flora	Ongoing	Ongoing	Ongoing
1.3	Get ClimateWise Now!	Design and deliver climate and energy education, and capacity building programs including vendor information workshops, residential home energy audits, CRAGs, promotion of residential bulk purchase programs, inviting individuals, households and business to adopt Climate 2020 goals, promoting the takeup of GreenPower, green electric cars, etc, and promoting government programs such as Green Loans, insulation rebates, etc.	High	High	High
1.4	Get ClimateWise Now!	Promote and facilitate the adoption of GreenPower; Climate 2020 target of 20 per cent of households using only GreenPower	High	High	High
1.5	Solar Homes	Solar technology and local energy generation (leg): promote and develop programs facilitating the adoption of solar technology and local sustainable energy generation, for example, through residential bulk purchase programs for photovoltaics, solar hot water systems, solar air conditioning, GreenPower, insulation, etc.	High	High	High
2. Governance					
2.1	Climate 2020	Co-ordinate and implement the Climate 2020 action plan including support and facilitation of the successful integrated delivery of all Climate 2020 programs	High	Ongoing	Ongoing
2.2	Climate 2020	Support the establishment an advisory group comprising key stakeholders with agreed upon Terms of Reference	SESAC *	SESAC *	SESAC *
2.3	Climate 2020	Adopt an 'investment' approach to Council's energy requirements, including research into and development of an 'energy investment/management model	High	Ongoing	Ongoing
2.4	Climate 2020	Identify priority actions and review annually - progress report Council Action Plan	High	Ongoing	Ongoing
2.5	Climate 2020	Identify and attract traditional and innovative sources of funding, including grant funding	Ongoing	Ongoing	Ongoing
2.6	SEZ	Explore potential strategic partnerships and develop as appropriate	High	Ongoing	Ongoing
2.7	SEZ	Investigate the establishment of a 'vehicle' to progress the development of the Doncaster Hill Smart Energy Zone Vision	Medium	Medium	Medium
2.8	Climate 2020 SEZ	Advocate via Council and NAGA for greater thermal efficiency of building envelopes, new buildings standards, renovation standards, NABERS/BASIX performance rating at point of sale or lease, and timely performance data from retailers and distributors	Ongoing	Ongoing	Ongoing
2.9	Climate 2020 SEZ	Advocate via Council and NAGA Towards Zero Net Emissions (TZNE) project for better data at household, postcode and municipal level, both individually as a Council and through other forums like NAGA	High	Ongoing	Ongoing
2.10	Climate 2020 SEZ	Advocate via Council and NAGA to state and federal governments to not derogate 'implementation of smart meters' to distributors which will create another monopoly (cf Telecom in the 1980s argued to have sole right to sell data modems)	Ongoing	Ongoing	Ongoing
2.11	Climate 2020 SEZ	Advocate via Council and NAGA for the necessary conditions accelerating the adoption of intelligent distributed energy systems including upgrading existing electricity grids to 'Smart Grid/ Intelligent Grids', gross feed-in-tariff, 'remote read' smart meters, an effective carbon pollution emissions scheme (one not supporting polluters or disadvantage large scale renewables, volunteer actions or household micro energy generation), appropriate regulatory, market and pricing arrangements that offer the necessary support and rewards to stimulate decarbonisation of energy system	Ongoing	Ongoing	Ongoing
2.12	Climate 2020	Facilitate and support Councillor and/or executive participation in the NAGA executive committee	High	Ongoing	Ongoing
2.13	Climate 2020	Investigate and design a strategy, including budget estimate, to develop a climate adaptation action plan	High	Ongoing	Ongoing
2.14	Climate 2020	Advocate for energy efficiency legislation for cars, air conditioning, TVs, appliances, etc.	Ongoing	Ongoing	Ongoing

Appendix 2: Climate 2020 implementation plan

Strategy					
No.	Program	Action	2009/10	2010/11	2011/12
2.15	Climate 2020 SEZ	Advocate for increased decarbonisation of energy system by increasing renewable energy generation in Victoria, both large scale and at household/neighbourhood scale (e.g. by increasing VRET, MRET targets, or by establishing effective gross feed in tariffs)	Ongoing	Ongoing	Ongoing
2.16	SHE Q RMS	Facilitate the integration of Climate 2020 into Council's Safety Health Environment and Quality Risk Management System (SHE Q RMS)	Ongoing	Ongoing	Ongoing
2.17	Climate 2020 SEZ	Establish necessary arrangements and policy drivers supporting Council achieving Climate 2020 and SEZ goals	Ongoing	Ongoing	Ongoing
3. Sustainable Urban Development and Master Planning - Small EcoFootprints					
3.1	Accelerating Sustainable Building	Implement the ASB program	High	Ongoing	Ongoing
3.2	Accelerating Sustainable Building	Investigate the opportunities for further development of the Sustainability Management Guidelines and where appropriate incorporate necessary tools into practice including Building Information Modelling(BIM), NABERS, LCADesign, and GreenStar	High	Ongoing	Ongoing
3.3	Climate 2020	Investigate whether Manningham City Council will accept the role as lead Council for the program, <i>Existing Residential Built Form - Solar Homes Program - Efficiency and De-carbonisation</i> , one of the key elements of the Northern Alliance for Greenhouse Action(NAGA) action plan - Towards Zero Net Emissions	High		
3.4	Climate 2020	Continue advocating for more stringent planning scheme and/or building code requirements through participation in various forums including the MAV ESD Advocacy Group (e.g. ESD incorporated in Victorian Planning Priorities and local planning schemes)	Ongoing	Ongoing	Ongoing
3.5	Climate 2020	Continue to progress the findings of the RMIT Carbon Neutral Communities Renewable Energy Resources study for Manningham, demonstrating even with today's renewable energy technologies, Manningham has the capacity to meet all its energy needs, including transport, through local energy generation	Ongoing	Ongoing	Ongoing
3.6	EEP	Continue promoting and facilitating walkable communities where facilities and/or transport nodes are less than 400 metres (e.g. Activity Centre plans for Jackson Court and Doncaster Hill)	Ongoing	Ongoing	Ongoing
3.7	EEP	Continue advocating a whole of government approach to facilitating the transition from car centric suburbia to walkable and sustainable urban villages	Ongoing	Ongoing	Ongoing
3.8	SEZ program	Implement the Doncaster Hill SEZ action plan	High	Ongoing	Ongoing
3.9	SEZ program	Facilitate and support transformation of the Civic Precinct into a smart energy zone, green precinct with integrated water cycle management, and sustainability education hub	High	Ongoing	Ongoing
3.10	SEZ program	Promote and facilitate intelligent distributed energy generation	High	High	High
3.11	SWMC *	Continue the investigation of sewage recycling for water which London is already doing	Ongoing	Ongoing	Ongoing
4. Local Economy - Thriving Local New' Economy					
4.1	Green Business Catalyst	Implement the Green Business Catalyst program	High		
4.2	Green Business Catalyst	Continue to promote and support local businesses becoming more sustainable	Ongoing	Ongoing	Ongoing
4.3	Green Business Catalyst	Continue to facilitate growth in local jobs	Ongoing	Ongoing	Ongoing
5. Transport - On the move					
5.1	Climate 2020	Advocate for and promote affordable zero emission cars	Ongoing	Ongoing	
5.2	Get ClimateWise Now!	Promote the use of green electric cars; design and deliver a program aimed at car dealerships and residents	Ongoing	Ongoing	High
5.3	* STWG	Investigate the establishment of a 'community mobility' program		High	Ongoing
5.4	* STWG	Investigate if Manningham City Council will accept the role as lead Council for the program, <i>Regional Cycling and Walking Strategy</i> , one of the key elements of the Northern Alliance for Greenhouse Action(NAGA) action plan - Towards Zero Net Emissions	High		
5.5	* STWG	Continue to progress the development of an effective, safe bike network including dedicated road lanes, regional linkages, and integrated with public transport.	Ongoing	Ongoing	Ongoing

Appendix 2: Climate 2020 implementation plan

Strategy					
No.	Program	Action	2009/10	2010/11	2011/12
5.6	* STWG	Continue to progress the development of an effective, community bus network including investigating door to door services and upgrade of existing services.	Ongoing	Ongoing	Ongoing
5.7	* STWG	Advocate for cheap, frequent, effective and integrated public transport to all major destinations	Ongoing	Ongoing	Ongoing
5.8	* STWG	Continue to progress the implementation of dedicated lanes on roads for cyclists and public transport	Ongoing	Ongoing	Ongoing
5.9	* STWG	Implement parking bays for electric vehicles, scooters and bikes		High	High
5.10	STWG * / Climate 2020	Advocate for energy rating for cars	Ongoing	Ongoing	Ongoing
5.11	STWG * / Climate 2020	Continue to advocate for integrated, effective and cheap transport infrastructure to be in place by 2016 (i.e. trams, trains, bike paths, buses and transport hubs)	Ongoing	Ongoing	Ongoing
5.12	STWG * / Climate 2020	Continue to progress the main streaming of bike paths by reducing road lanes allocated to cars	Ongoing	Ongoing	Ongoing
6. Operational Performance					
6.1	Climate 2020	Facilitate the installation of 'remote read' smart meters within Manningham	Ongoing	Ongoing	Ongoing
6.2	Ecofootprint System	Promote the introduction of effective feed-in-tariff system	Ongoing	Ongoing	Ongoing
6.3	Ecofootprint System	Provide environmental performance reports to the community and Council	Ongoing	Ongoing	Ongoing
6.4	Get ClimateWise Now!	Promote and support Carbon Rationing Action Groups (CRAGs)	Ongoing	Ongoing	Ongoing
6.5	SEZ	Facilitate operational building efficiency by promoting increased open and transparent reporting of building energy performance at time of lease or sale	Ongoing	Ongoing	Ongoing
6.6	Solar Homes	Promote and facilitate the installation of energy generation and other solar technologies at a household and business level	Ongoing	Ongoing	Ongoing
7. Environment - Cool, Green and Natural					
7.1	Community Environmental Education	Continue to promote smart and secure lifestyles understanding of potential impacts of everyday choices on the health of natural systems and demonstrate how to protect and conserve habitats, soils, waterways, natural resources, fauna and flora	Ongoing	Ongoing	Ongoing
7.2	Community Environmental Education	Continue to promote the value of trees for shade and cooling effects, minimising heat island effects, their role in the water cycle, and where indigenous, their habitat benefits and especially provision of habitat corridors	Ongoing	Ongoing	Ongoing
7.3	Green Wedge Strategy	Continue to protect and value Manningham's natural heritage for current and future generations	Ongoing	Ongoing	Ongoing
7.4	Green Wedge Strategy	Continue to monitor the 'state of the environment'	Ongoing	Ongoing	Ongoing
7.5	Green Wedge Strategy	Continue to foster and support stewardship of Manningham's natural assets through establishment of community groups such as Landcare, Waterwatch, rabbit groups and friends groups	Ongoing	Ongoing	Ongoing
7.6	Green Wedge Strategy	Investigate the establishment of a peri-urban regional biodiversity local government group and funding opportunities through the Sustainability Accord	Medium		
7.7	Parks and Recreation	Council continues or even increases its tree planting program. Trees valued for shade and cooling effect and, where indigenous, their habitat benefits	Ongoing	Ongoing	Ongoing
7.8	Sites of (Biological) Significance	Continue to monitor and maintain a record of Manningham's natural assets	Ongoing	Ongoing	Ongoing
8. Leadership – Council Leads the Way					
8.1 Governance					
8.1.1	Climate 2020	Commit to all new buildings commissioned from 2009/10 be carbon neutral, in particular, the Pines and the new Community Hub	High		
8.1.2	Climate 2020	Commit to achieving a carbon neutral vehicle fleet by 2020	High	Ongoing	Ongoing
8.1.3	Climate 2020	Commit to generating 40 per cent of Council's operating energy requirement through sustainable local energy generation	High	Ongoing	Ongoing
8.1.4	Climate 2020	Commit to achieving 20 per cent energy efficiency by 2020	High	Ongoing	Ongoing
8.1.5	SWMC *	Investigate the feasibility of committing to achieving carbon neutral waste management by 2020	Ongoing	High	High

Appendix 2: Climate 2020 implementation plan

Strategy					
No.	Program	Action	2009/10	2010/11	2011/12
8.2 Sustainable Urban Development and Master Planning - Small Footprints					
8.2.1	Accel Sustainable Building	Implement the ASB program across Council's capital works program	High	Ongoing	Ongoing
8.2.2	Accel Sustainable Building	Investigate the opportunities for incorporating the necessary tools into Council practice including Building Information Modelling (BIM), NABERS, LCADesign and GreenStar		High	Ongoing
8.2.3	Accel Sustainable Building	Investigate opportunities for further developing the Sustainability Management Guidelines and, where appropriate, incorporating necessary tools into practice such as Building Information Modelling (BIM), NABERS, LCADesign, STEPS / SDS and GreenStar		High	Ongoing
8.2.4	Climate 2020	Identify and clarify the roles of Councillors, Chief Executive and directors in facilitating and supporting the acceleration of sustainable building across Council's capital works program	Ongoing	High	Ongoing
8.3 Decarbonise Energy Supply					
8.3.1	Energy Smart	Implement Energy Smart program		High	Ongoing
8.3.2	Energy Smart	Identify opportunities to meet Council's energy requirements through sustainable local energy generation		Medium	Ongoing
8.3.3	Energy Smart	Investigate the appropriate mix of GreenPower and offsets to meet Council's energy decarbonisation commitment		Medium	Ongoing
8.3.4	Sustainable Building Operation	Negotiate a common GreenPower contract on behalf of all tenants of Council owned community facilities		Ongoing	Ongoing
8.4 Vehicle Fleet - On the move towards carbon neutral					
8.4.1	Manningham Maintenance	Investigate alternative energy and fuel technologies to contribute to having a carbon neutral vehicle fleet by 2020 (e.g. green electric cars)	Ongoing	Ongoing	Medium
8.4.2	Manningham Maintenance	Continue to progress the energy efficiency performance of the vehicle fleet	Ongoing	Ongoing	Ongoing
8.5 Council Staff - Education and Capacity Building					
8.5.1	Accel Sust Building	Increased capacity to drive sustainable building and urban development on Doncaster Hill, for major developments and across Council Capital Works, and attract external funding	Ongoing	High	Ongoing
8.5.2	Climate 2020	Increased capacity to respond to the challenges of energy efficiency, decarbonising our energy system, responding to climate change, and attracting external funding	High	Ongoing	Ongoing
8.5.3	Climate 2020	Participation in the Northern Alliance for Greenhouse Action (NAGA) increases capacity at many levels: individual, organisational, executive and Councillor. It enables regional action either through projects or advocacy for necessary policy change supporting rapid action in the face of climate change.	High	Ongoing	Ongoing
8.5.4	Community Environmental Education	Continue to design and deliver environmental sustainability programs with a particular focus on waterways health, sustainable living, youth and healthy horse pasture management	Ongoing	Ongoing	Ongoing
8.5.5	Ecofootprint System	Continue to increase capacity to drive improved environmental performance of Council through installation, maintenance and advice associated with implementation of diagnostic tools such as EcoTracker, smart meters and monitoring and reporting via the internet. Support improved operational performance and benchmarking of buildings, street lighting, vehicle fleet, and water regimes for sports ovals	Ongoing	Ongoing	Ongoing
8.5.6	Energy Smart	Increased capacity to meet Council's own energy needs locally, to deliver energy efficient lighting and to attract external funding	Ongoing	High	Ongoing
8.5.7	Get ClimateWise Now!	Increased capacity to deliver climate and energy action programs to the community, and promote government rebate programs (e.g. Green Loans, insulation rebates)	Ongoing	Ongoing	Ongoing
8.5.8	GOGO	Continue to develop the necessary organisational culture, knowledge and skills to deliver improved sustainability performance	Ongoing	Ongoing	Ongoing
8.5.9	Green Business Catalyst	Increased capacity to promote sustainable business practices, attract/create innovative 'new' green economy businesses, form strategic partnerships, generate new jobs, and attract funding	High	Ongoing	Ongoing
8.5.10	SEZ	Increased capacity to promote, advocate and facilitate more sustainable urban development with regard to energy demand, distributed energy generation, building performance, metering and monitoring, and attracting external funding	High	Ongoing	Ongoing
8.5.11	Solar Homes	Increased capacity to facilitate residential group purchase of sustainable household technologies thereby increasing household level resilience and micro infrastructure	High	Ongoing	Ongoing

Appendix 2: Climate 2020 implementation plan

Strategy					
No.	Program	Action	2009/10	2010/11	2011/12
8.5.12	Sustainable Building Operation	Increased capacity to deliver energy efficient Council community buildings through effective retrofits, proactive energy management, and benchmarking, and attract external funding	Ongoing	High	Ongoing
8.6 Operational Performance - Increasing Efficiency					
8.6.1	Ecofootprint System	Continue the EcoFootprint System technical working group	Ongoing	Ongoing	Ongoing
8.6.2	Energy Smart	Continue investigation and planning for energy efficient public lighting changeover	High	Ongoing	
8.6.3	Sustainable Building Operation	Investigate and develop a plan to benchmark Council's building assets, set minimal energy and water performance standard (e.g. 4/5/6 star NABERS), create a strategic framework for retrofitting, and identify implementation actions, timetable and budget	High	Ongoing	Ongoing
8.6.4	Sustainable Building Operation	Progress the active energy management of Council's major buildings	High	Ongoing	Ongoing
8.6.5	Climate 2020	Continue participation in the NAGA street lighting working group	Ongoing	Ongoing	Ongoing
8.6.6	Energy Smart	Investigate GreenPower options prior to batch changeover and after; making necessary GreenPower purchases as appropriate	Ongoing	Ongoing	Ongoing
8.7 Funding					
8.7.1	Climate 2020	Continue progressing the establishment of a revolving sustainability fund	Medium	Ongoing	Ongoing
8.7.2	Climate 2020	Continue identifying and attracting both traditional and innovative sources of funding	Medium	Ongoing	Ongoing
8.7.3	Ecofootprint System	Continue the development of a measures database supporting the effective implementation of a revolving sustainability fund	Medium	Ongoing	Ongoing

Abbreviations

- * SESAC Strategic Environmental Sustainability Advisory Committee
- * SWMC Strategic Waste Management Committee
- * STWG Strategic Transport Working Group

Appendix 3.1: Climate 2020 co-ordination and implementation program

Objective

Facilitate the implementation of the Climate 2020 Action Plan to progress the Vision - *A Climate Wise Community by 2020*, goals and objectives through identified key strategies and programs.

Overview

The impacts of climate change are already being experienced with high summer temperatures, deaths through heat stress, increased frequency and severity of bushfires, severe drought, water restrictions, gardens and trees dying due to lack of rain, turf on sports fields dying, extreme weather events (drought in Victoria and floods in Queensland), and food prices rising due to crop failure.

Leading scientists say we have until 2016 to hit 'peak greenhouse emissions' and be on a trajectory to achieve 100 per cent (cf 1990) reductions by 2050 (Chapter 7). Without any action at all, emissions from this municipality will increase by 21 per cent.

Climate 2020 programs aim to reinject energy capacity back into community and Council's core skill set. These programs are an investment, not a cost. They will result in savings to ratepayers and increase our ability to attract substantial funding, such as Sustainability Victoria's Smart Energy Zone (\$500,000) and the Federal Government Green Precinct (\$1.5 million) funds.

The aim of the Climate 2020 action plan is to establish a broad framework to direct decision making and action moving the Manningham community towards a Climate Wise future by 2020. In particular, the three objectives – efficiency, decarbonise and leadership – and specific measurable goals for the community, Council operations and households, will shape Manningham's response to the climate challenge and contribute to the necessary reorientation of our energy/economy systems.

Scope

Climate 2020 addresses the energy we use in our daily our lives, referred to as operational energy.

Operational energy falls into two broad categories:

- * Stationary energy: typically gas and electricity
- * Transport energy: typically petrol, diesel and LPG

Climate 2020 Objectives

The key objectives of the Climate 2020 action plan are decarbonisation of energy supply, efficient use of energy and leadership by community and Council.

Major Tasks

The major tasks in this program are to:

1. Progress the realisation of Climate 2020's Vision, objectives, goals, supported by policy drivers and adoption of the following strategies:
 - * Governance: investigate and develop the necessary structures, arrangements, and advocacy (organisational, legislative and non-legislative) to drive delivery of Climate 2020 goals and objectives
 - * Leadership: community and Council leads the way via sustainable building assets, energy efficient street lighting, carbon neutral Council by 2020, green electric vehicles and generating sustainable energy locally
 - * Operational Performance: continuous improvement through open and transparent monitoring of actual performance
 - * Funding: attracting ongoing funding through traditional and innovative mechanisms
2. Facilitate the following strategies:
 - * Community Education and Capacity Building: design and deliver programs supporting strong, informed, capable, resilient and willing communities
 - * 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
 - * Environment – *cool, green and natural*: Manningham protects and enhances its natural environment, values trees for cooling and shade (nature's air conditioner), lessens 'heat island' effects by reducing impermeable surfaces
 - * Transport – *on the move*: live, work, learn and play locally, walk and cycle often, or carbon neutral mobility, whether it be effective and innovative public transport systems or green electric cars
3. Further develop and implement the Climate 2020 action plan, goals and objectives.

Appendix 3.1: Climate 2020 co-ordination and implementation program

4. As part of the Council Action Plan process, prepare an annual progress report, including a review and update of action plan as necessary
5. Participation in networking processes as appropriate, for example, NAGA, Victorian Local Sustainability Accord, ICLEI Cities for Climate

Outcomes/Outputs

- * Implementation of Climate 2020 Action Plan
- * Communication Plan
- * Energy Investment approach and model
- * Annual Progress Report
- * Progress towards achieving Climate 2020 Vision – A Climate Wise Community by 2020
- * Empowered community
- * Progress towards achieving Climate 2020 objectives and targets
- * Increased alignment and effective integration between climate 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.

Budget

\$38,000 per year for three years

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

References

1. Climate 2020 Action Plan (August 2009)
2. Doncaster Hill Smart Energy Zone Action Plan (August 2009)

Appendix 3.2: Energy Smart program

Objective

To improve Council's own internal capacity so it can demonstrate leadership to the community. In particular to ensure Council achieves its own goals for local energy generation, energy efficient lighting, and purchase of renewable energy and carbon offsets as required.

Overview

Achieving a carbon neutral Council by 2020 relies on two key strategies: (1) Council's ability to generate a significant proportion of its own energy needs; and (2) Council's ability to implement energy efficient street lighting solutions.

Major Tasks

The major tasks in this program are to:

1. Investigate and identify local energy generation opportunities for Council operations, especially building assets related Capital Works projects
2. Develop a local energy action plan for Council to generate 40 per cent of its own energy requirements by 2020
3. Investigate, identify and implement energy efficient street lighting solutions
4. Ensure Council meets a minimum of 20 per cent GHG reduction compared with 1996 baseline, through purchase of GreenPower or offsets as required
5. Progress the Climate 2020 action plan, goals and objectives
6. 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

- * Annual progress report and energy generation plan
- * Council generates an increasing percentage of its own energy requirements
- * Energy efficient street lighting
- * Progress towards achieving Climate 2020 Vision – *A Climate Wise Community by 2020*
- * Progress towards achieving Climate 2020 objectives and targets
- * Increased alignment and effective integration between climate 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

Budget

\$38,000 per year for three years

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

Appendix 3.3: Sustainable Building Operation and Retrofits program

Objective

To improve Council's own internal capacity so it can demonstrate leadership to the community. In particular to ensure Council achieves its own goals to deliver energy efficient buildings through effective retrofits, proactive energy management, benchmarking and attracting external funding

Overview

Achieving a carbon neutral Council by 2020 relies on Council's ability to design, construct and operate energy efficient buildings.

Major Tasks

The major tasks in this program are to:

1. Investigate and implement, as appropriate, relevant Climate 2020 actions such as:
 - * New Council buildings be designed and operated to a minimum 4 star NABERS energy and water rating, and major new buildings to a minimum 5star NABERS energy water rating and 5 star GreenStar
 - * All new buildings to be carbon neutral, achieved through distributed energy generation and purchase of renewable energy / GreenPower and offsets
 - * Proactive energy management of major buildings using the EcoFootprint System and Ecotracker
 - * Opportunities for sustainable energy generation pursued as appropriate
 - * Investigate placing all tenants under single electricity and gas contracts that include renewable energy/GreenPower
 - * Investigate benchmarking of all Council owned buildings
 - * Investigate incorporating necessary design and operational performance tools (e.g. NABERS, SDS scorecard, LCADesign, MUSIC) into current Council capital works practice
2. Progress the Climate 2020 action plan, goals and objectives
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

- * Annual progress report
- * Progress towards benchmarking Council owned buildings and improving energy performance
- * Continuous improvement of operational performance of major Council buildings through pro-active energy management (e.g. building tune ups of HVAC systems)
- * Continuous improvement of operational performance of minor Council buildings through benchmarking, building retrofit program and working with tenants
- * Progress towards achieving Climate 2020 Vision – *A Climate Wise Community by 2020*
- * Progress towards achieving Climate 2020 objectives and targets
- * Increased alignment and effective integration between climate 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

Budget

\$38,000 per year for three years

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

Appendix 4.1: SEZ co-ordination and implementation program

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 enable 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) driving 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 including 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
2. 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 supporting strong, informed, capable, resilient and willing communities
3. Develop and implement a three year action plan informed by SEZ Consultation Summary, a summary of findings arising from the consultation process
4. 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

Budget

\$38,000 per year for three years. Future and ongoing initiatives including in kind contributions by Council to be further investigated.

Appendix 4.2: Accelerating Sustainable Building program

Objective

To further progress the Doncaster Hill Vision for sustainable buildings created via an integrated design approach. The buildings created through 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 over the lifecycle of the development. The ultimate goal, while only aspirational at this stage, is to deliver buildings by 2030 that have zero greenhouse emissions.

Overview

Buildings account for 40 per cent of total greenhouse emissions when embodied energy in materials and operational energy over the lifetime of a 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 a sustainable urban environment.

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, to refurbishment and demolition. 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 progressing 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, revised annually and informed by the SEZ 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 benefit;
- * 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 4.3: Green Business Catalyst program

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 which incidentally create local jobs by:
 - * Establishing a 'premium identity' for Doncaster Hill as a location in which sustainability focussed businesses cluster and congregate
 - * Investigate and identify the necessary conditions that support 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 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

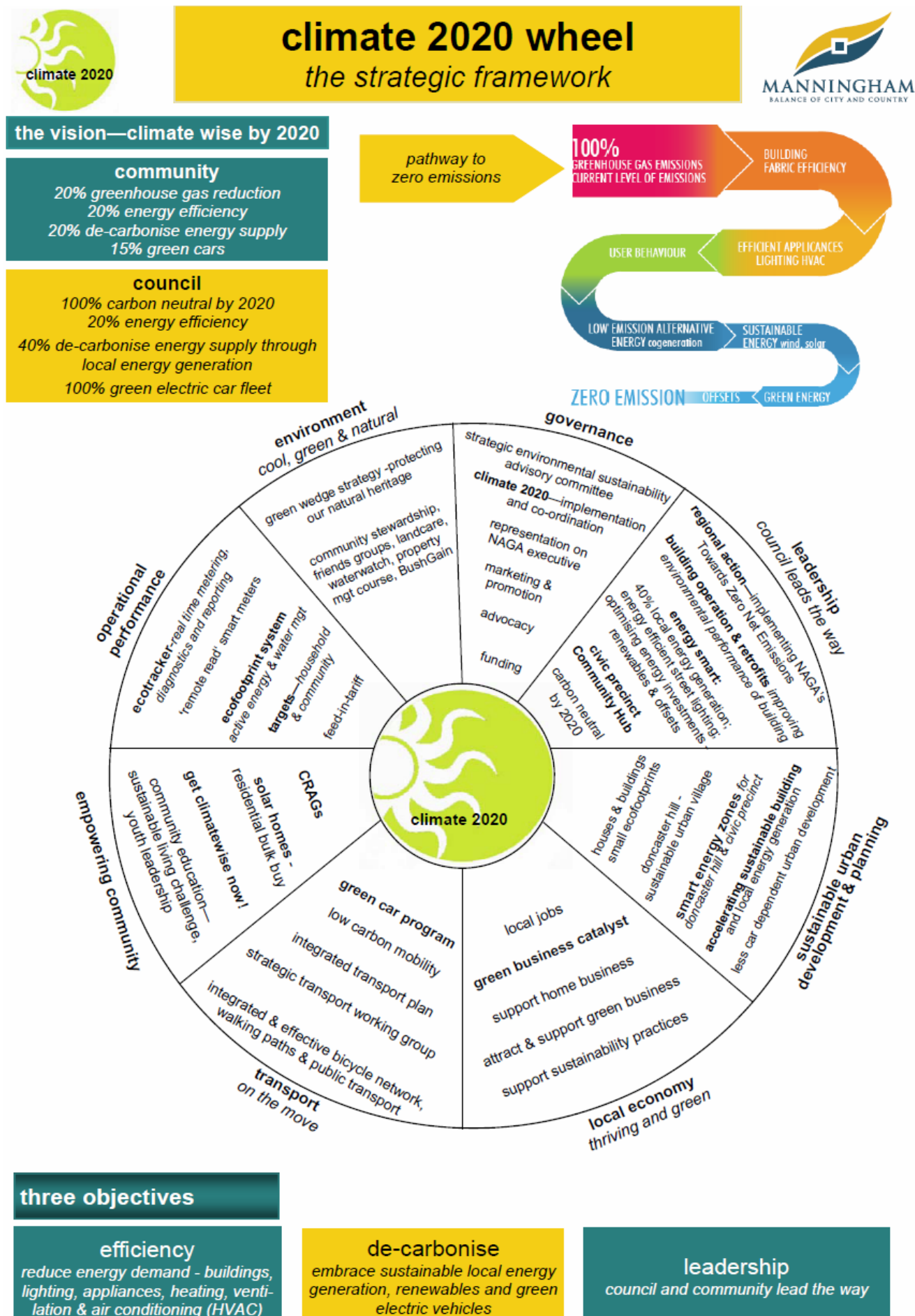
- * Doncaster Hill attracts innovative and green businesses demonstrating ongoing prosperity
- * Strategic relationships and partnerships established to support Green Business Catalyst
- * Increased local employment opportunities providing increasingly sustainable careers and livelihoods
- * Green Business 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 5: Climate 2020 wheel – the strategic framework



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