

**ETHEKWINI
MUNICIPALITY**

Ethekwini Municipality

Energy Strategy
2008





EThekweni Municipality Energy Strategy

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eThekweni Municipality Energy Strategy

Executive Summary

Introduction

This is the first *Energy Strategy* developed by eThekweni Municipality and builds upon work already carried out in the areas of *Greenhouse Gas Inventory* development and *State of Energy* reporting. It further derives impetus from the work embodied within eThekweni Municipality's *Climatic Future for Durban*, which identifies the Climate Change-related challenges which lie ahead for the city and delivers appropriate responses to address those challenges.

The eThekweni Municipality 2006 State of Energy Report identified that a clear and focussed local Energy Strategy is paramount to the successful implementation of sustainable energy practices in eThekweni. It further proposed that the objectives of a Municipal Energy Strategy should be derived from those contained within the country's National Energy Efficiency Strategy, which states:

South Africa is a developing nation with significant heavy industry, which is by its nature energy intensive. This energy intensive economy largely relies on indigenous coal reserves for its driving force. At first sight there would appear to be an apparent paradox between using less energy and developing a healthy and prosperous nation based on energy intensive activities. This is not the case. In recent years energy efficiency has significantly gained in stature and has become recognised as one of the most cost-effective ways of meeting the demands of sustainable development.

The benefits of energy efficiency upon the environment are self-evident. These benefits are of particular relevance, as South Africa remains one of the highest emitters of the Greenhouse gas CO₂ per capita in the world. At a local level the problems of SO₂ and smoke emissions have been the focus of concern for many communities living adjacent to heavily industrialised areas. Energy efficiency can address both the macroscopic and microscopic aspects of atmospheric pollution.

The arguments for the adoption of formal energy efficiency initiatives at a local or municipal level are, therefore, compelling. National Government has taken a bold step in launching such a strategy within the context of a coal-based economy, and local authorities are encouraged to follow that lead.



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Energy Strategy Vision

Vision Statement

"By 2020, eThekweni Municipality will be Africa's most caring and liveable city."
(IDP, eThekweni Municipality, 2006-2011)

In support of this City vision eThekweni Municipality will:

Encourage sustainability in energy sector development and energy use through efficient supply-side and demand-side practices and increased uptake of renewable energy sources,

Thereby:

Minimising the undesirable impacts of energy use upon human health and the environment, particularly climate change and contributing towards secure and affordable energy for all.

Themes and Goals

The overall approach of this Strategy is to split the target areas into a number of Themes, which encompass broad sectoral classifications. Based upon the Sustainability Objectives highlighted by the eThekweni Municipality State of Energy Report of 2006, each Theme includes an overall Goal statement which encapsulates the broad intentions of the various interventions identified. The Theme Goals are as follows:

Theme A Residential Sector
To encourage clean and sustainable domestic energy use to improve energy security and contribute towards the social health and welfare of communities throughout the EMA.
Theme B Local Authority and Public sector
To work towards the elimination of all global and local pollutants arising from energy use within eThekweni Municipality's own activities, as well as throughout the wider EMA, thereby promoting sustainable energy use and production across all sectors.
Theme C Industrial, Commercial and Agribusiness Sector
To support the application of energy efficiency and renewable energy technologies in the industrial, commercial and agricultural sectors to work towards the elimination of net GHG emissions and all other energy-related atmospheric pollutants.
Theme D Transport Sector
To work towards the elimination of all atmospheric pollutants arising from transport energy use by maximising the application of sustainable, energy efficient and renewable energy technology in both the public and private sector. To promote non-motorised transport and disincentivise private motorised transport. Development of a clean, safe, accessible and affordable integrated public transport system for all is key to achieving this goal.



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Theme Targets and Overall Energy Targets

The Energy Strategy prescribes Theme-specific Targets which combine to deliver an overall target for the Municipality in percentage terms. In this way, the impacts of Action Plans and interventions may be tracked over time, thereby enabling an ongoing assessment of the success of the Strategy to be made. It is proposed that the eThekweni Municipality Energy Strategy timeline should align with that of the Integrated Development Plan (IDP) for the eThekweni Municipal Area (EMA): 2020. This will provide sufficient time for the development and fruition of a diverse portfolio of Renewable Energy and Energy Efficiency projects across all four themes, and will allow significant progress to be made towards meeting challenging and meaningful Targets.

To summarise, the Targets for EMA are as follows:

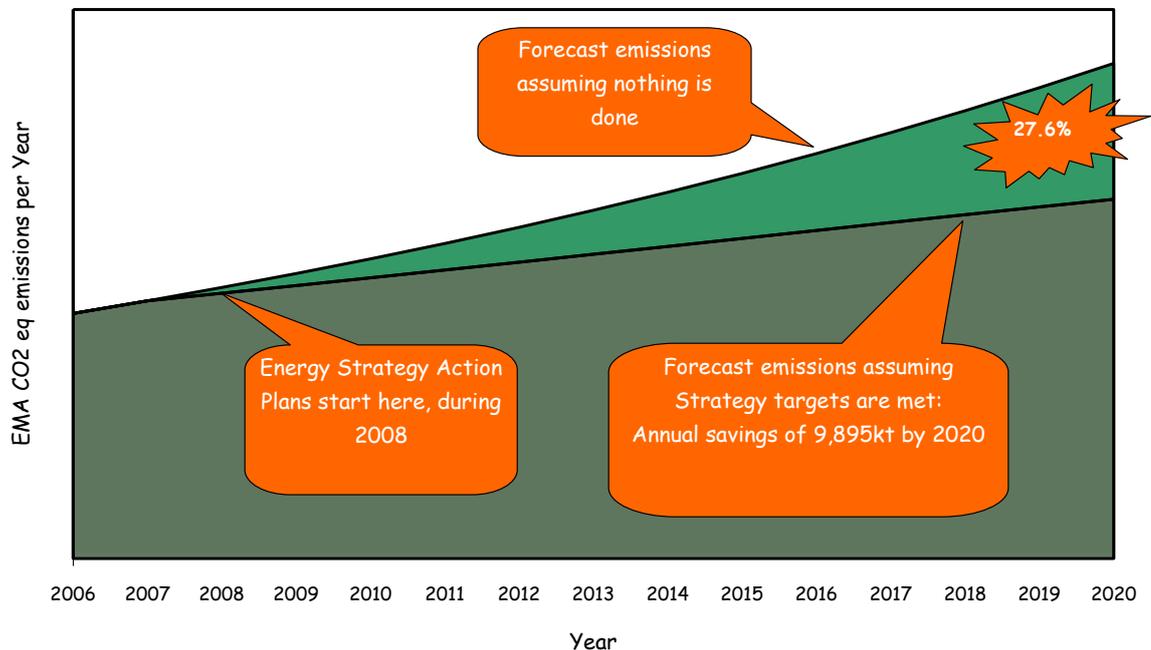
Theme	Sector	% CO ₂ Reduction by 2020	Annual Saving by 2020
A	Residential	24.5	1,530 kt CO ₂ equivalent
B	Local Authority & Public	33.0	357 kt CO ₂ equivalent
C	Industry, Commerce, Agribusiness	30.0	5,739 kt CO ₂ equivalent
D	Transport	24.0	2,269 kt CO ₂ equivalent
Totals		27.6	9,895 kt CO₂ equivalent

Figure A shows a simplified progression of how the overall EMA target of 27.6% will appear over time.



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Figure A: How the Targets will look over time



Energy Strategy Action Plans

For each Theme, the critical issues concerning energy usage have been established. These issues have subsequently been prioritised based upon the goals and objectives agreed for the strategy. Using this approach, phased Action Plans have been developed per Theme. Action plans include details of the relevant rationale behind them ("why"), the stakeholders involved ("who"), the expected timescales ("when"), and what interventions are proposed ("how"). The Action Plans span a wide range of technical, managerial and institutional interventions and have been designed to deliver Energy Efficiency (EE) and Renewable Energy (RE) improvements across all sectors.

Within each action plan, a series of priority projects have been developed. The benefits are aligned where possible with the Strategic Goals identified. The process of implementation addresses all likely barriers which may arise and seeks the removal of these barriers in conjunction with the engagement of stakeholders. The process of engaging stakeholders may indeed result in the identification of novel solutions to many of the barriers encountered. The issue of finance will be addressed during the implementation phase, and the Municipality has pre-empted this by considering the sourcing of alternative financing mechanisms at an early stage. These are likely to include Energy Service Company (ESCO) finance routes or other third-party financing, preferential loans or grants, or green financing.



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Energy Strategy Monitoring

Although at the outset of a strategic programme the issue of results monitoring may seem a distant one, the Municipality is considering a monitoring plan at the earliest stage. Methodologies have been drafted which will effectively and transparently monitor the progress of the strategic programme, in particular progress against targets. Liaison with the National monitoring plans for energy efficiency and renewable energy will be necessary and advantageous.

Summary

Although this Energy Strategy forms only one element of EThekweni Municipality's response to Climate Change, it is nonetheless considered to be a key element. It has become clear that the ever-increasing environmental pressures which are being brought to bear on our surroundings as a direct result of energy usage cannot be sustained in the longer-term. This Strategy sets out to provide a framework upon which significant inroads can be made with regards to real and measurable improvements in our energy performance as a community. It is evident that success will not be achieved by technical means alone and a range of interventions which also span management and institutional aspects is necessary for a rounded approach to energy optimisation. Education, awareness, organisation and empowerment will all have an equally vital role to play during the course of the Strategy roll-out programme.



EThekweni Municipality Energy Strategy

Glossary of Terms and Abbreviations Used

Term	Meaning
AQMP	Air Quality Management Plan
AMEU	Association of Municipal Electricity Undertakings
BAT	Best Available Technique
BAU	Business as Usual
Biofuels	Renewable fuels made from plants that can be used to supplement or replace the fossil fuels petroleum and diesel used for transport. The two main biofuels are bio-ethanol and bio-diesel. Bio-ethanol is produced from the fermentation of sugar or starch in crops such as corn and sugar cane. Bio-diesel is made from vegetable oils in crops such as soybean, or from animal fats or agricultural waste. Depending on the processes used to make biofuels, greenhouse emissions from cars and fuel-powered machinery can be substantially reduced by their use.
bpd	Barrels (of oil) per day
btu	British Thermal Unit: An energy unit equivalent to 100,000 Therms.
CaBEERE	Capacity Building in Energy Efficiency and Renewable Energy
CBD	Central Business District
CCP	Cities for Climate Protection
CDM	Clean Development Mechanism: A Kyoto Protocol initiative under which projects set up in developing countries to reduce atmospheric carbon generate tradable credits called Certified Emission Reductions (CERs). The credits can be used by industrialized nations to offset carbon emissions at home and meet their Kyoto reduction targets. The projects include afforestation, reforestation and implementation of clean fuels technology.
CEF	Central Energy Fund
CER	Certified Emissions Reduction
CFL	Compact Fluorescent Light: An energy efficiency globe
CH ₄	Methane: A greenhouse gas and the major component of some fuel gases
CHP	Combined Heat and Power, Co-generation



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CO	Carbon Monoxide: A product of incomplete combustion
CO ₂	Carbon Dioxide: A product of combustion and an important Greenhouse Gas
DAEA	Department of Agriculture and Environmental Affairs
DCCI	Durban Chamber of Commerce and Industry
DEAT	Department of Environment and Tourism
DME	Department of Minerals and Energy
DMOSS	Durban Metropolitan Open Space System
DNA	Designated National Authority
DoH	Department of Housing
DoT	Department of Transport
DSM	Demand Side Management
DSW	Ethekekwini Cleansing and Solid Waste
DTI	Department of Trade and Industry
DWAF	Department of Water Affairs and Forestry
EBSST	Electricity Basic Support Services Tariff
EDI	Electricity Distribution Industry
EDRC	Energy Development and Research Council
EE	Energy Efficiency: Using less energy to perform the same function. "Energy conservation" is another common term in use but it has the connotation of doing without in order to save energy rather than using energy more efficiently.
EEDSM	Energy Efficiency Demand Side Management
EMA	Ethekekwini Metropolitan Area
EMD	Ethekekwini Environmental Management Department
EMEMP	Ethekekwini Municipality Environmental Management Policy
EMS	Environmental Management System
ESCO	Energy Services Company
EWS	Ethekekwini Water and Sanitation Unit
FBE	Free Basic Energy
Fossil Fuel	Oil, coal and natural gas that originates from decayed plants and animals
GDP	Gross Domestic Product



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<i>GHG</i>	<i>Greenhouse Gas</i>
<i>GJ</i>	<i>Gigajoule: A measure of energy use equivalent to 10⁹ Joules</i>
<i>Green Power</i>	<i>Electricity generated using Renewable Energy as the primary energy source</i>
<i>GVA</i>	<i>Gross Value Added</i>
<i>GW</i>	<i>Gigawatt: A measure of energy demand equivalent to 10⁹ Watts</i>
<i>GWh</i>	<i>Gigawatt-hour: A measure of energy use equivalent to 1 GW demand sustained over 1 hour</i>
<i>GWP</i>	<i>Global Warming Potential</i>
<i>HEM</i>	<i>High Efficiency Motor</i>
<i>HGV</i>	<i>Heavy Goods Vehicle</i>
<i>HOD</i>	<i>Head of Department</i>
<i>HOV</i>	<i>High Occupancy Vehicle</i>
<i>HFO</i>	<i>Heavy Furnace Oil, or Heavy Fuel Oil</i>
<i>ICLEI</i>	<i>International Council for Local Environmental Initiatives</i>
<i>IDP</i>	<i>Integrated Development Plan</i>
<i>IEA</i>	<i>International Energy Agency</i>
<i>IEP</i>	<i>Integrated Energy Plan</i>
<i>IPCC</i>	<i>Intergovernmental Panel on Climate Change</i>
<i>IPP</i>	<i>Independent Power Producer</i>
<i>Joule</i>	<i>A unit of energy equal to about 0.24 calories</i>
<i>KPI</i>	<i>Key Performance Indicator</i>
<i>kt</i>	<i>Kilotonne: A measure of mass equivalent to 10³ Tonnes</i>
<i>kW</i>	<i>Kilowatt: A measure of energy demand equivalent to 10³ Watts</i>
<i>kWh</i>	<i>Kilowatt-hour: A measure of energy use equivalent to 1 KW demand sustained over 1 hour</i>
<i>LCA</i>	<i>Lifecycle Analysis</i>
<i>LED</i>	<i>Light Emitting Diode</i>
<i>LFG</i>	<i>Landfill Gas: The product of decomposition from landfill sites. Approximately 50% of LFG is normally Methane.</i>
<i>LPG</i>	<i>Liquefied Petroleum Gas</i>
<i>M&T</i>	<i>Monitoring and Targeting: An important management tool for energy efficiency</i>



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MPP	Multi-point Plan, relevant to the South Durban Basin
MRG	Methane Rich Gas: Fuel gas generated from coal
MW	Megawatt: A measure of energy demand equivalent to 10^6 Watts
MWh	Megawatt-hour: A measure of energy use equivalent to 1 MW demand sustained over 1 hour
NAAMSA	National Automobile Association of South Africa
NBI	National Business Initiative
NDoT	National Department of Transport
NEEA	National Energy Efficiency Agency
NEES	National Energy Efficiency Strategy
NEMA	National Environmental Management Act
NERSA	National Energy Regulator of South Africa
NGO	Non-governmental Organisation
NILU	Norwegian Institute for Air Research
NO _x	Nitrogen Oxides: A product of combustion
N ₂ O	Nitrous Oxide: A product of combustion and a GHG
NPA	National Ports Authority
NWMS	National Waste Management Strategy
PPA	Power Purchase Agreement
RE	Renewable Energy: Energy obtained from sources that are essentially inexhaustible, unlike, for example, the fossil fuels, of which there is a finite supply. Renewable sources of energy include wind, photovoltaic, and solar thermal energy
RED	Regional Electricity Distributor
SABS	South African Bureau of Standards
SAEE	South African Energy Efficiency Association
SALGA	South African Local Government Association
SANS	South African National Standard
SAPIA	South African Petroleum Industries Association
SARS	South African Revenue Service
SDB	South Durban Basin
SETA	Sector Education & Training Authorities
SMME	Small, Medium and Micro Enterprises



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SO ₂	Sulphur Dioxide: A product of fossil fuel combustion (especially coal and HFO)
SOE	State of the Environment
SOEn	State of Energy
StatsSA	Statistics South Africa
SWH	Solar Water Heater: A device used to harness the warmth of sunlight to heat water for domestic use
TCO _{2e}	Tonnes of Carbon Dioxide Equivalent: The metric measurement unit for greenhouse emissions. The global warming impact of all greenhouse gases is measured in terms of equivalency to the impact of carbon dioxide (CO ₂). For example, one tonne of emitted methane, a far more potent greenhouse gas than carbon dioxide, is measured as 23 tonnes of CO ₂ equivalent, or 23 tCO _{2e} .
Therm	An energy unit equivalent to 29.31kWh, or 105.5MJ.
TJ	Terajoule: A unit of energy use equivalent to 10 ¹² Joules
toe	Tonnes of Oil Equivalent
TOU	Time of Use: An electricity tariff which weights unit price in favour of off-peak power usage
TREC	Tradeable Renewable Energy Certificate
UKZN	University of KwaZulu Natal
UNFCCC	United Nations Framework Convention on Climate Change
VSD	Variable Speed Drive
Watt	A standard unit of power defined as one Joule of energy transferred or dissipated in one second
WSSD	World Summit on Sustainable Development
WTW	Wastewater Treatment Works



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Energy Unit Conversion factors

The following energy unit conversion factors are adopted throughout this report and are those used by the Department of Minerals and Energy in the Digest of South African Energy Statistics:

To	From	1J	1kWh	1toe	1Btu
1J		1	0.278×10^{-6}	0.2388×10^{-6}	0.948×10^{-3}
1kWh		3.6×10^6	1	0.86×10^{-6}	3.412×10^3
1toe		42×10^9	11,630	1	39.68×10^6
1Btu		1.055×10^3	0.293×10^{-3}	0.252×10^{-9}	1

CO₂ Conversion Factors

The following conversion factors are used throughout this report. Sources are IPCC, eThekweni Municipality GHG Inventory Report (2006/06) and Eskom:

Energy Carrier	CO ₂ emission factor, kg/kWh
Electricity	0.97
Illuminating Paraffin	0.20
Liquefied Petroleum Gas	0.21
Bituminous Coal	0.30
Petrol	0.24
Diesel	0.25
Heavy Fuel Oil	0.26
Woodfuel	0.00



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Calorific Values of Common Fuels

This table provides Gross (higher) Calorific Value (GCV) data for commonly encountered fuel sources and energy carriers. These data are adopted throughout this report and are those used by the Department of Minerals and Energy in the Digest of South African Energy Statistics:

Fuel	GCV	Units	Density
Solid fossil fuels			
Bituminous Coal (general purpose)	24.3	MJ/kg	-
Bituminous Coal (coking coal)	30.1	MJ/kg	-
Coke	27.9	MJ/kg	-
Liquid fuels			
Liquefied Petroleum Gas (LPG)	26.7	MJ/l	0.541
Petrol	34.2	MJ/l	0.723
Illuminating Paraffin	37.0	MJ/l	0.788
Aviation Fuel	34.3	MJ/l	0.793
Diesel	38.1	MJ/l	0.839
Heavy Fuel/Furnace Oil (HFO)	41.6	MJ/l	0.984
Refinery Gas	45.2	GJ/tonne	-
Gaseous fuels			
Natural Gas	41.0	MJ/m ³	-
Coke oven gas	17.3	MJ/m ³	-
Blast furnace gas	3.1	MJ/m ³	-
Landfill gas	10.7	MJ/m ³	-
Coal gas (Sasol)	18.0	MJ/m ³	-
Sasol Methane Rich Gas (MRG)	38.0	MJ/m ³	-
Solid renewable fuels			
Bagasse (wet)	7.0	MJ/kg	-
Bagasse fibre (dry)	14.0	MJ/kg	-
Biomass (wood, dry, typical)	17.0	MJ/kg	-

Note: Data for density shown above are relative to water at standard conditions of temperature and pressure.



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1 Energy and the eThekweni Municipal Area

1.1 The eThekweni Municipal Area

eThekweni Municipality is the local government body responsible for managing Durban. Durban is an African city on the eastern seaboard of South Africa, and is located in the province of KwaZulu-Natal (see Figure 1). The population of Durban ranges from the rural to the urbanised and from the formally serviced to the un-serviced. It is a multicultural society which faces a complex mix of social, economic and environmental challenges. The eThekweni Municipal Area (EMA):

- Is 2,297km² in size, comprising 1.4% of the land area of the province;
- Has an annual municipal budget of R13.92 billion¹;
- Has approximately 18,000 municipal employees;
- Has a population in excess of 3.5 million.

1.2 The Economy

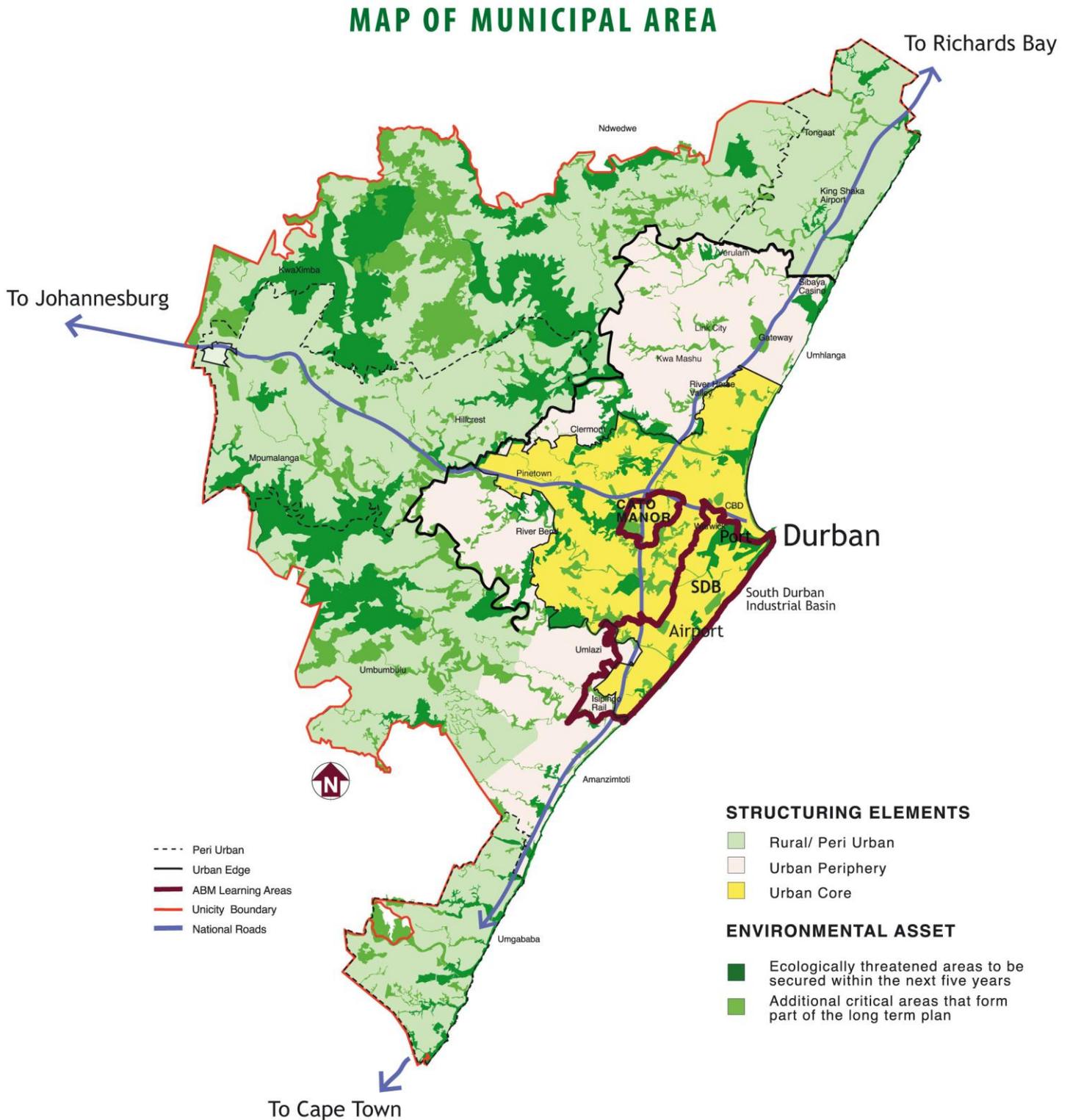
- Durban has the largest and busiest port on Africa's east coast - over 1.9million containers were processed during 2005/06;
- Manufacturing, finance and tourism are the largest sectors in the economy;
- Tourism is concentrated along the coast, with emerging eco and cultural tourism opportunities in the western areas;
- eThekweni Municipality's *Gross Value Added (GVA)* comprises 66.3% of the total provincial *GVA* and 9.9% of the national *GVA*;
- The eThekweni Municipality was awarded the highest credit rating in Africa for a Municipality in October 2006 by the *Global Credit Rating Company*.

¹ 2006/2007 budget data



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Figure 1 Map of eThekweni Municipality





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1.3 The Ecosystem

South Africa is the third most bio-diverse country in the world, and the EMA contains:

- Four of the country's eight biomes;
- Seven broad vegetation types;
- Over 2000 plant species;
- 97 km of coastline and 4,000km of rivers;
- 18 catchments and 16 estuaries;
- An open space system of over 63,000 hectares.

1.4 The People

Durban is ethnically diverse, with a cultural richness of mixed beliefs and traditions. These add vibrancy and depth to the experience of living in, working in and visiting the city. The demographic breakdown of the population of the DMA is as follows:

- | | |
|-----------------|-----|
| • Black African | 68% |
| • Asian | 20% |
| • White | 9% |
| • Coloured | 3% |

The city's demographics indicate that 68% of the population are within the employable age-bracket, and 28% of the population are below the age of 19 years.

1.5 Municipal Energy Balance²

One of the important outputs of the State of Energy reporting process was the development of a Municipal Energy Balance. This provided an overview snapshot of the complete energy picture for the EMA, including energy imports and

² All data shown in this section is sourced from the eThekweni Municipality State of Energy Report, 2006.

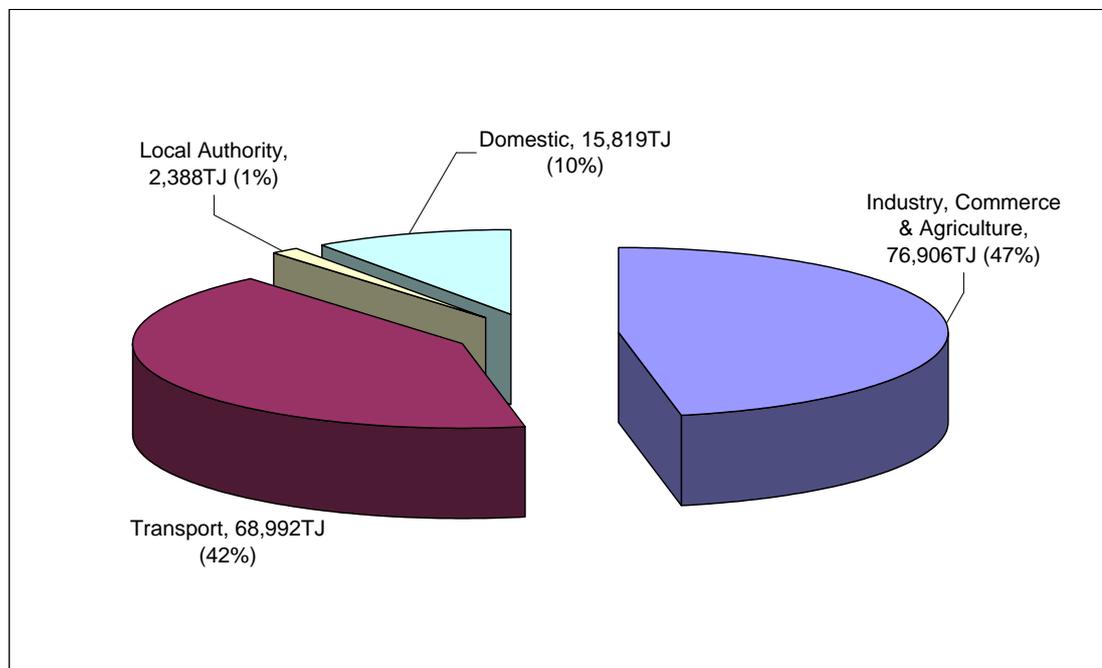


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exports, demand-side usage by sector, and supply-side data by primary and secondary energy sources.

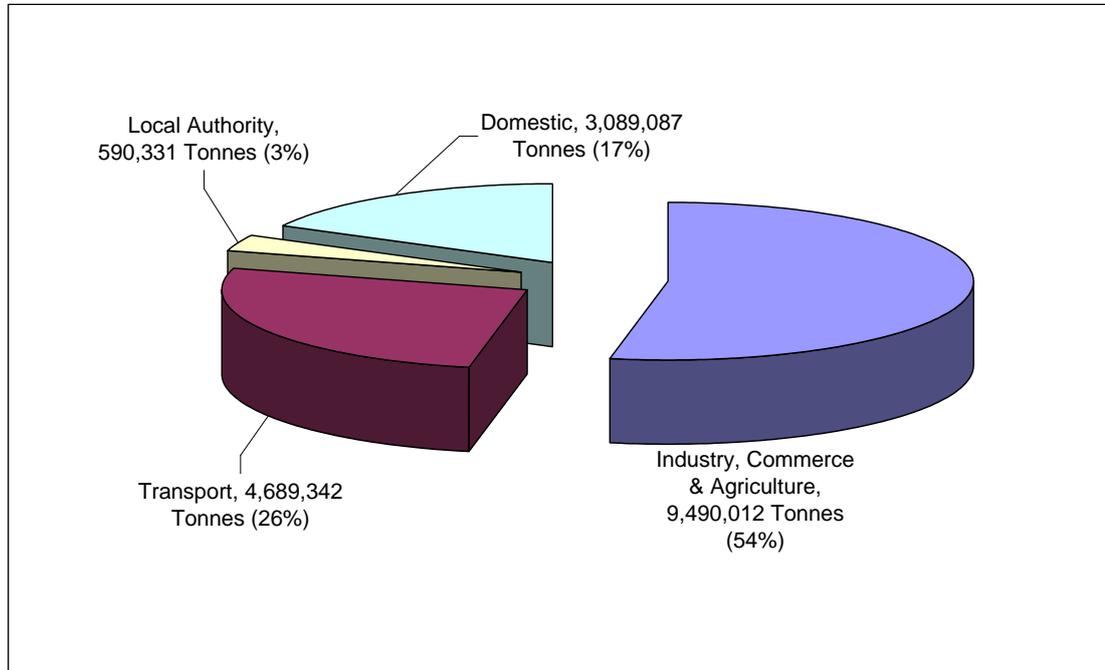
It is important to note that industrial energy usage contributes some 47% of final energy demand, closely followed by the transport sector which accounts for 42% of end-use. This is significant, as it supports the notion that these sectors are priority areas to address from the point of view of energy efficiency improvements. Graphical representation of end-user energy statistics is shown in Figure 2.

Figure 2 EThekweni annual energy use (Terajoules) by end-user sector



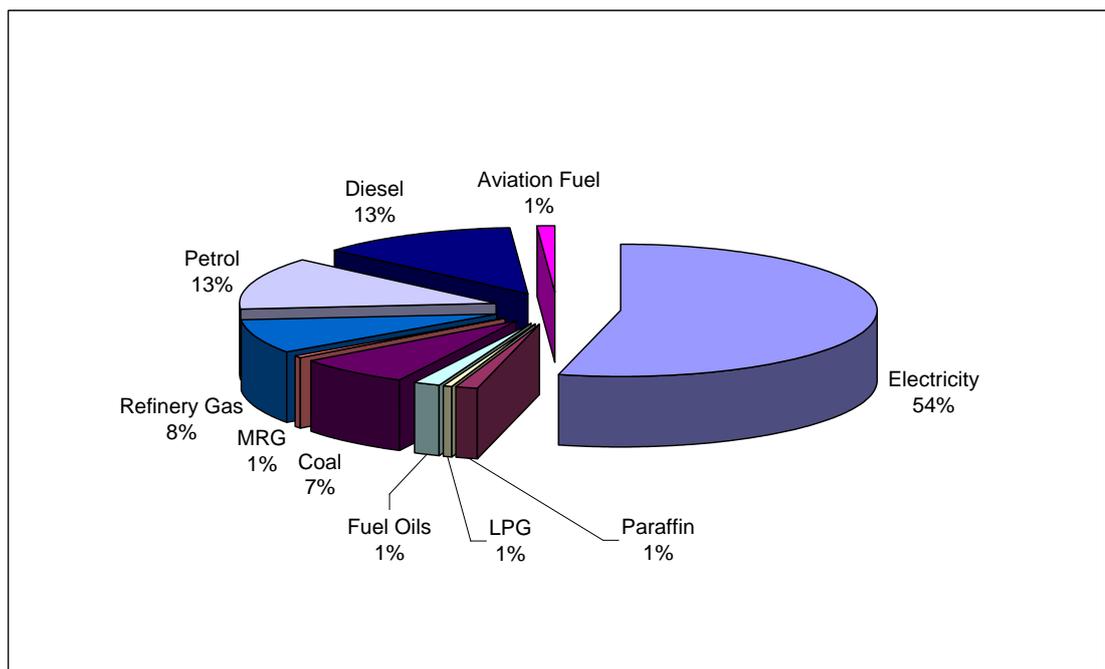
Whilst energy-related emissions from all sectors take several forms and include both *global* and *local* emissions, the various energy sources have been accounted to enable allocation of CO_2 emissions across all sectors. In the analysis shown in Figure 3 it is clear that industry plays the major part in the issuance of CO_2 accounting for in excess of 50% on an ongoing basis.

Figure 3 Ethekewini annual tonnes CO₂ emissions by end-user sector



The influence of electricity usage upon the municipal CO₂ footprint can be clearly seen with reference to Figure 4. The salient fact here is that although locally electricity is seen as a clean, pollution-free energy source, the impacts of its generation are felt elsewhere via the huge amounts of CO₂ emitted from South Africa’s largely coal-based generation plant in the Highveld.

Figure 4 Ethekewini annual CO₂ emissions by energy type, %





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1.6 eThekweni Municipality & Sustainable Development

Durban was the first city in South Africa to accept the Local Agenda 21³ mandate as a corporate responsibility in 1994. Subsequently, Durban was also the first city in South Africa to accept the Local Action 21⁴ (2003) mandate which emerged from the World Summit on Sustainable Development in 2002.

The city's Integrated Development Plan (IDP) for 2003 to 2007 provides the vision and mechanism for achieving long-term sustainable development. Sustainable development can be defined as development that *meets the needs of the present without compromising the ability of future generations to meet their needs*. The concept of sustainable development is not new, and it now features within most national and local policy documentation dealing with environmental issues. The concept of sustainability is usually disaggregated into three areas, commonly termed "cornerstones", as follows:

Environmental Sustainability

This encompasses the sustainable procurement of natural resources, as well as the manner in which the use of those resources impinge upon the atmosphere, natural water systems, and terrestrial ecological systems in general. For energy usage these aspects include fossil fuels extraction, effluent production as a result of energy conversion, and atmospheric pollution arising from combustion of fossil fuels.

From the viewpoint of the eThekweni Municipality, one of the most important (and topical) aspects of environmental sustainability is the effect of atmospheric pollution. This may be broadly split into two areas: local pollution which directly affects liveability within the EMA (Oxides of Sulphur, Oxides of Nitrogen, particulate emissions, smoke, etc.) and CO₂ emissions which result in Climate Change effects at a global level. Both of these are directly linked to energy usage and are mitigated by improvements in energy efficiency and the uptake of renewable energy sources.

Economic Sustainability

An economically sustainable outlook is paramount for the ongoing development of South Africa's business sectors. Not only should energy be affordable to all, but local industry and commerce should be empowered to undertake their

³ Local Agenda 21: the global action plan for socially, environmentally and economically sustainable development adopted at the 1992 Earth Summit.

⁴ Local Action 21: a mandate to local authorities worldwide to move from agenda to action and ensure an accelerated implementation of sustainable development.



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operations at least energy cost. This factor is determined by the level of energy efficiency achieved within an enterprise, as well as the cost implications of delivering that energy. This premise is equally relevant to the Governmental and Residential Sectors, such that affordable and efficiently-used energy resources contribute significantly to the general wealth of the population, and allow Government Authorities to maximise spending where it is needed most.

Social Sustainability

This area relates to energy affordability, but also to employment and health issues. It is self-evident that an improvement in environmental conditions through reducing atmospheric emissions will have a direct knock-on benefit with regards to public health. Furthermore, the judicious use of energy has several positive spin-offs in terms of job creation, due to enhancement in the performance in the economic sector, as well as creation of a new energy efficiency sector itself.

Consideration of the items summarised above reveals that close links exist between energy planning, energy conservation, Municipal Environmental Policy and eThekweni Municipality's Climate Protection Plan. Furthermore, links with sustainable development criteria are obvious.



2 Energy Strategy Formulation Process

From the outset, the process of conceptualising and formulating the various sections which make up the Energy Strategy has been an open and participative one. A consultative body was established at an early stage, termed the Energy Advisory Committee (EAC), whose purpose was to ensure that the views and opinions of the widest range of stakeholders were taken into consideration throughout. The EAC membership comprised representatives from industry, commerce, Local and National Government, transport organisations, utilities, renewable energy service providers, educational establishments, Non-Governmental Organisations (NGOs), political organisations and civil society. The roles and responsibilities of the EAC included:

- Providing information for the strategy development process ;
- Participating in discussions relating to energy and energy efficiency issues within the municipality;
- Providing comment on documentation relating to energy and energy efficiency issues;
- Coordinating feedback sessions with their own and other relevant organisations within the sector; and
- Providing regular feedback to their organisations and to secure a mandate to input into the strategy development process.

The EAC and the Municipality's Energy Team have met regularly throughout the Strategy development process. The Energy Team comprised the Project Consultant, together with Ethekewini Municipality Environmental Management Department. The roles and responsibilities of the Energy Team included:

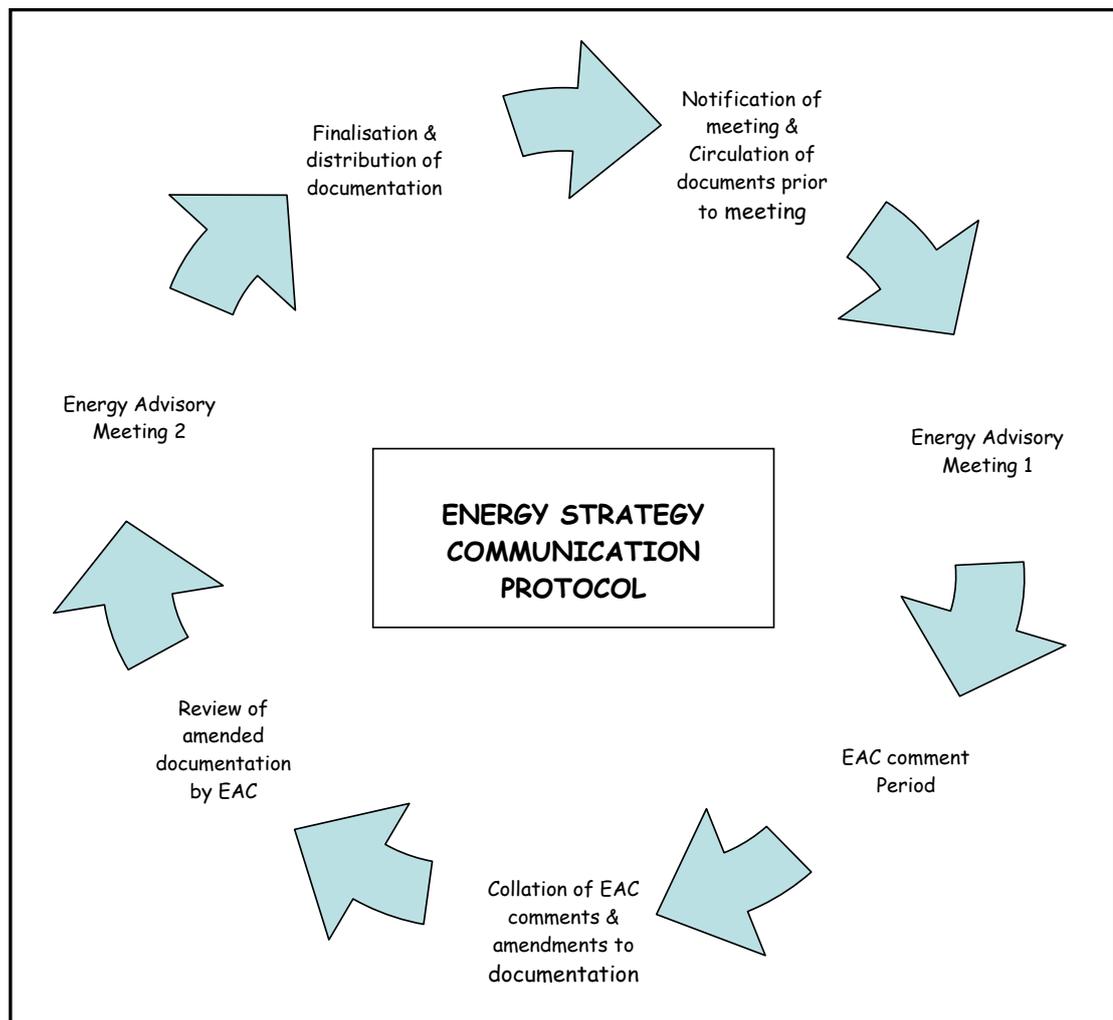
- Formulating and distributing information related to the energy strategy development;
- Coordinating meetings and formulating & distributing meeting resolutions;
- Collating EAC comments;
- Amending documentation and information related to the energy strategy development; and
- Providing feedback to the EAC.



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The development of the Energy Strategy was approached in a step-wise manner, whereby each section was drafted, commented upon by the EAC, and subsequently completed prior to progression to the following section. This process ensured adequate opportunity for all stakeholders to provide input to the Energy Strategy development phase. The various steps within the development process are described by Figure 5.

Figure 5 Energy Strategy Communication Protocol





3 A Guide to the Energy Strategy

This Energy Strategy document is structured in such a way as to provide a concise, yet structured, account of the intentions of eThekweni Municipality regarding EE and RE over the coming decade and beyond. Each section has been compiled in a logical and accessible way to allow completeness and ease of understanding. The section contents are summarised as follows:

Section 4 is a short section which underlines the legal mandate by which the Strategy is established. The mandate is derived from both National and local legislative frameworks, as well as non-legislative means such as National Energy Strategy.

Section 5 contains a statement of the over-arching Vision of the Energy Strategy. This vision links to the City's long-term Integrated Development Plan, and forms the basis of subsequent Goals and Action Plans which feature elsewhere within the Strategy.

Section 6 sets out to discuss the issue of energy targets in some detail. The pre-existing National targets for EE and RE as considered, as well as how these influence the targets which are proposed locally for each of the Strategy Themes. This section also addresses the Strategy timeline, together with proposing a suitable measurement unit for the targets themselves.

Sections 7 to 10 deal exclusively with each of the Strategy Themes, and cross-cutting issues are considered in Section 11. The Themes proposed relate directly to broad economic sectors as shown in the Table 1. It is important to note that all transport-related activities associated with Themes A, B and C are included within Theme D.

Table 1 Themes within the Energy Strategy

Theme A	Residential Sector
Theme B	Local Authority and Public sector
Theme C	Industrial, Commercial and Agribusiness Sector
Theme D	Transport Sector

Each theme is discussed in terms of its headline Goal, specific Objectives, Targets and Action Plans which have been developed through a thorough consultative programme within each sector. The successful achievement of each of the Themes' Goals, Objectives and Targets, via effective Action Plans, is considered key to meeting the Strategy Vision. The Objectives which have



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been identified for each Theme are derived from the findings of the 2006 EThekweni Municipality State of Energy Report and these address the priorities within each Sustainability Cornerstone. The Goal statement for each Theme encapsulates the essence of these sustainability objectives within a single phrase and serves as a concise reference for the reader.

The targeting sections within each theme are presented as a series of "what if" scenarios, and illustrate the Business as Usual outcomes against the target outcomes assuming the Strategy is successful. The target outcomes are stated as both a percentage improvement, as well as an absolute Carbon saving, based upon projected economic growth between 2007 and the Strategy Time Horizon, 2020.

Each Theme is presented with a detailed Action Plan of interventions and programmes which are specifically structured in order to maximise the uptake of RE technologies and EE practices. The Action Plans are split into heading as shown in Table 2:

Table 2 Action Plan Headings and their meanings

Measure or Intervention	A broad outline of what the Action Plan intends to achieve, as well as any relevant background information, or motivation, on the measure or intervention.
Actions	An itemised description of the main activities which will be necessary to implement the Action Plan. The list is not intended to be exhaustive, rather indicative.
Objectives	Lists which of the Theme's Sustainability Objectives are addressed by the Action Plan. The reference numbers of Objectives are used for simplicity.
Timeframe	A broad categorisation of the implementation timeframe for the Action Plan; i.e. Long-term, medium-term, short-term and immediate.
Lead Agency & Key Stakeholders	Lists the key players who will be involved.
Contribution to Theme Target	Expressed in terms of absolute Carbon reductions, but only in Action Plans where a meaningful calculation can be made.

The issue of Target Monitoring is dealt with in Section 12. A targeting methodology is proposed which includes for improvements in both RE and EE uptake, and which encompasses the broad intentions of the proposed National RE and EE plans.



4 Energy Strategy Mandate

4.1 Introduction

The mandate for developing and adopting a Municipality Energy Strategy is explained in this section.

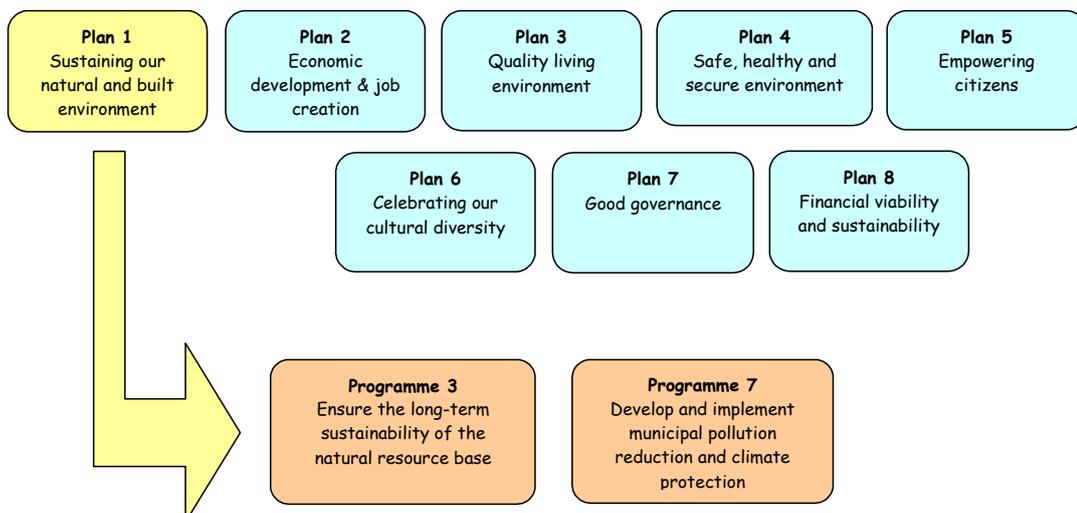
4.2 Municipal Systems Act

The Municipal Systems Act 32 (2000) requires each Municipality to develop an Integrated Development Plan (IDP). The IDP is a five-year strategic document directing all Municipal activities. It aims to achieve the Municipal vision by responding to social, environmental and economic needs of citizenry. The IDP is reviewed annually in consultation with communities and stakeholders. EThekwini Municipality has produced IDPs for the period 2003-2007 and most recently for 2006-2011.

4.3 EThekwini Municipality Integrated Development Plan

The eThekwini Municipality's IDP, 2006-2011, focuses on turning the City's Vision into action. The City's delivery plan is organised into eight separate but related plans, as seen in Figure 6, of which Plan 1 relates in part (through Programme 3 and Programme 7) to Climate Protection and therefore sustainable energy use.

Figure 6 EThekwini Municipality IDP, 2006-2011





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Of particular importance to the development of the Energy Strategy is the link to climate change. According to the National Climate Change Strategy⁵: *There is now more confidence that global climate change is a threat to sustainable development, especially in developing countries, and could undermine global poverty alleviation efforts and have severe implications for food security, clean water, energy supply, environmental health and human settlements.*

EThekwini Municipality acknowledges the threat of climate change in its IDP through Programme 7: Develop and Implement Municipal Pollution Reduction and Climate Protection. The Municipality is developing appropriate mitigation, avoidance and adaptation plans through its Climate Protection Programme⁶.

4.4 Environmental Management Policy for EThekwini Municipality

EThekwini Municipality's firm commitment to the ongoing mitigation, adaptation and avoidance of Greenhouse Gas (GHG) emissions is in line with the Goals and Objectives set out in the 2005 Environmental Management Policy for the Durban Metropolitan Area. Of particular importance is Objective E2, which states:

"To enable an integrated energy planning approach in planning for and delivering energy services"

The Policy is a platform, giving direction to all sectors of local government and facilitating the development of sector-specific strategies in response to environmental responsibilities. The Policy contributes to the effectiveness of the IDP in promoting environmental sustainability, as well as economic efficiency and social equity, all key components of a robust Energy Strategy.

4.5 National White Paper on Renewable Energy

The purpose of this White Paper is to set out Government's principles, goals and objectives for renewable energy. It furthermore commits Government to a number of actions to ensure that renewable energy becomes a significant part of its energy portfolio over the next ten years. Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years, a sustainable, non-subsidised

⁵ DEAT, 2004

⁶ The eThekwini Municipality's Climate Protection Programme is driven by municipal activities aimed at addressing and reducing the impacts of climate change. Climate protection related strategies, plans, programmes and projects undertaken throughout the Municipality by different departments all fall under the auspices of this Programme.



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alternative to fossil fuels. To embark upon a deliberate path towards this goal, the Government's medium-term (10-year) target is:

10,000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1,667 MW) of the projected electricity demand for 2013 (41,539 MW). This is equivalent to replacing two (2x 660 MW) units of Eskom's combined coal fired power stations.

4.6 The Energy Strategy of South Africa, 2005

The Energy Strategy was launched in March, 2005 by the Department of Minerals and Energy (DME), and is the first consolidated Governmental document geared towards the development and implementation of energy efficiency practices in South Africa.

The Strategy sets a national target for energy efficiency improvement of 12% by 2015. This target is expressed in relation to the forecast national energy demand at that time, and therefore allows for current expectations of economic growth. This target is expected to be achieved by implementing various energy efficiency programmes, the majority of which involve low cost interventions that can be achieved with minimal investments. The Strategy makes use of a range of generic implementing instruments, which are applied as appropriate to meet specific needs within each Sector Programme.



5 Energy Strategy Vision

Vision Statement:

"By 2020, eThekweni Municipality will be Africa's most caring and liveable city." (IDP, eThekweni Municipality, 2006-2011)

In support of this City vision eThekweni Municipality will:

Encourage sustainability in energy sector development and energy use through efficient supply-side and demand-side practices and increased uptake of renewable energy sources,

Thereby:

Minimising the undesirable impacts of energy use upon human health and the environment, particularly climate change and contributing towards secure and affordable energy for all.



6 Energy Strategy Targets and Timeline

6.1 Introduction

Targets are considered a vital aspect of this Energy Strategy, as without realistic and challenging Targets the progress and success of the programme will be impossible to gauge.

The Strategy prescribes high-level Targets which are specific to each of the four main themes. These individual Targets combine to deliver an overall target for the Municipality in percentage terms. In this way, the impacts of our Action Plans and interventions may be tracked over time, thereby enabling an ongoing assessment of the success of the Strategy to be made. Without these detailed analyses it will be impossible to say whether or not the Energy Strategy is having any impact on any given sector.

6.2 What is a Target?

A target can be defined as any desired goal, outcome or something at which to aim. By definition, therefore, a target must be measurable and should be attached a timeframe in which it is intended to be reached. For this Energy Strategy the Targets are put forward in such a way as to specify a desired outcome, measured in specific terms, which is to be achieved during a predefined time period.

6.3 Basis of EE and RE Targets in South Africa

There has been a great deal of research done in recent years, both locally and internationally, regarding the long-term potential for energy savings. It has been demonstrated that combining the efficient use of energy with the optimal use of renewable sources can deliver a long-term sustainable global energy solution. This scenario assumes a 100% uptake level of all best available technologies, which may be unrealistic within the timeframe of the Energy Strategy described in Section 6.8.

Whilst truly sustainable energy should be held as a long-term Vision for the future, this Strategy proposes achievable and challenging Targets towards supporting the Strategy's Vision. The potential for energy savings and RE uptake have been the subject of several recent reports undertaken by National Government. The reports listed in Table 3 refer to the potential for energy savings and renewable energy uptake nationally. Several of these reports were instrumental in the national RE Target and EE Target decision-making processes.



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Table 3 Recent Studies on RE and EE potential in South Africa

Report Title	Date	Available from this web link:
Baseline Study: Energy Efficiency	2002	http://www.dme.gov.za/pdfs/energy/cab_eere/energy_baseline_study.zip
Energy Efficiency Savings Projections	2003	http://www.dme.gov.za/pdfs/energy/cab_eere/energy_savings_report.zip
Renewable Energy Landfill Gas Resources	2004	http://www.dme.gov.za/pdfs/energy/cab_eere/landfill_gas_resource_in_sa.pdf
Exploitable Biomass Resources	2004	http://www.dme.gov.za/pdfs/energy/cab_eere/final_report_biomass.pdf
Baseline Study: Hydroelectricity	2002	http://www.dme.gov.za/pdfs/energy/cab_eere/baseline_hydro.zip
Baseline Study: Solar Power	2002	http://www.dme.gov.za/pdfs/energy/cab_eere/baseline_solar.zip
Baseline Study: Wind Generation	2003	http://www.dme.gov.za/pdfs/energy/cab_eere/baseline_wind.zip

6.4 The Energy Efficiency Savings Model

The EE Savings Projections study undertaken during 2003 was an important input document for the National EE Targets; the report developed likely scenarios for energy savings from various proposed government energy efficiency policies. The model used was the Long range Energy Alternatives Planning tool (LEAP), developed by the Stockholm Environmental Institute (SEI). The South African model structure was developed and populated by the Energy Research Institute (ERI) for the national Integrated Energy Planning (IEP) process of the DME.

The basic methodology used is outlined as follows:

- The baseline scenario was established, which was an approximation of business as usual developed by previous modelling work;
- An average technical potential for energy saving was established for key items of equipment;
- Two sets of implementation rates were estimated, one for the maximum theoretical potential and a second for a 'likely savings' scenario, based on international experience for various measures;



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- The effect of the measure was estimated in terms of the maximum theoretical potential implementation and in terms of the likely potential scenario.

Using these scenarios, savings estimates were developed for energy consuming sectors for specific policies. These were then aggregated and overall savings estimated. The LEAP modelling undertaken during 2003 formed the basis of the National EE Targets, which form the basis of the eThekweni Municipality Energy Strategy EE Targets.

It is important to bear in mind that comparison of RE and EE Targets between nations must be undertaken with some care, and requires great depth of understanding in terms of Country-specific conditions. For example, factors such as industry mix, population density and atmospheric conditions will have profound influence upon the nature and scale of energy Targets. It is not valid to simply adopt another country's EE or RE target without first understanding the detailed basis of that Target.

6.5 National Energy Efficiency Targets

Under the Energy Efficiency Strategy of the Republic of South Africa⁷ the South African Government set Targets for reductions in final energy demand (both overall and by sector) to be achieved by 2015. The EE Strategy has proposed an energy efficiency target of 12% Final Energy Demand Reduction by 2015. It is important to note that the target is expressed as a percentage reduction against the *projected* national energy usage in 2015. In other, words, the target allows for growth amongst all sectors and the draft targeting methodology proposed by the DME supports this principle.

Breaking-down the target into end-user sectors, the Targets are stated as follows:

- | | |
|------------------------------------|-----|
| • Industry and commerce: | 15% |
| • Public and commercial buildings: | 15% |
| • Residential: | 10% |
| • Transport: | 9% |

Each target is based upon the 2015 time horizon and each uses the basic principle of measurement allowing for sector growth with time.

⁷ DME, 2005



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6.6 National Renewable Energy Target

The South African Government has established a target for the role that RE will play in the energy generation mix in South Africa. This target is documented in the cabinet approved White Paper on Renewable Energy, (November 2003). The target is stated as: *An additional 10,000 GWh of RE contribution to final energy consumption by 2013, to be produced mainly from biomass, solar, and small-scale hydro.* The renewable energy is to be utilised for both power generation and non-electric technologies such as solar water heating and biofuels.

The RE White Paper further states that the target is: *Approximately 4% (1,667 MW) of the projected electricity demand for 2013 (41,539 MW). This is equivalent to replacing two (2x 660 MW) units of Eskom's combined coal fired power stations.*

The selection of the renewable applications will initially be based on the least-cost principle. The 10,000 GWh target will be implemented in three phases during the 2004 - 2013 period. The renewable energy strategy will need to be monitored on a regular basis to determine the effectiveness of the measures and technologies employed to meet the overall target by 2013.

6.7 Draft National Biofuels Target

The Draft Biofuels Industrial Strategy of South Africa was released for public comment by the DME during November 2006. The draft Strategy proposes a target for biofuels contribution to road-based transport modes via a range of fiscal and institutional interventions. The draft target is described within the following excerpt: *The Biofuels draft strategy aims to achieve a biofuels average market penetration of 4.5 %, of liquid road transport fuels (petrol and diesel) in South Africa by 2013, which is achievable without excessive support by utilising surplus agricultural capacity.*

6.8 Strategy Timeline and Monitoring of Targets

In establishing an Energy Strategy Timeline for the EMA, it is assumed that uptake of new EE and RE initiatives across all sectors is presently at a business as usual (BAU) state. In other words, there has yet been no unprecedented move towards energy conservation or RE technologies, other than those adopted as part of normal business, residential or transport activities.

It is proposed that the eThekweni Municipality Energy Strategy timeline should align with that of the IDP for the EMA: 2020. This will provide sufficient time



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for the development and fruition of a diverse portfolio of RE and EE projects across all four themes, and will allow significant progress to be made towards meeting challenging and meaningful Targets. Figure 7 illustrates the intended duration of the Energy Strategy in relation to its Targets, together with four proposed "Checkpoints", or Monitoring Points, placed at significant intervals over the 13-year timeline.

Figure 7 Energy Strategy Timeline and Monitoring Checkpoints

Year	
2006	Baseline year
2007	Baseline Data gathered for 2006 via GHG Inventory
2008	Energy Strategy launch and start-point
2009	
2010	Checkpoint 1: Interim Monitoring for eThekweni Energy Strategy
2011	Monitoring undertaken for 2010
2012	
2013	Checkpoint 2: National RE White Paper Time Horizon
2014	Monitoring undertaken for 2013
2015	Checkpoint 3: National EE Strategy Time Horizon
2016	Monitoring undertaken for 2015
2017	
2018	
2019	
2020	Checkpoint 4: EtheKweni Energy Strategy Time Horizon
2021	Monitoring undertaken for 2020

6.9 A Measuring Unit for Targets

For targeting purposes it is proposed that a unit of measurement be adopted which best supports the main aim of the Strategy, which is to reduce GHGs. The targeting process should, at the same time, enable reporting on EE and RE within a single unit of measurement. The basis of the units used is the direct result of energy use (or energy savings) upon the emission of the major GHG, Carbon Dioxide (CO₂) into our atmosphere. For example, each kWh of electricity saved results in a GHG saving of 0.98kg of CO₂.

The proposed unit of target measurement for all themes is:

Percentage (%) Tonnes CO₂ reduction achieved between baseline year (2006) and horizon year (2020).



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In a similar way to the National EE Targets, it is important to allow for sector growth and decline when establishing and reporting on Targets for the EMA. The basic principle is to ensure that Targets are reported against what the emissions levels would have been (i.e. without EE/RE intervention) at the current level of sector activity.

It must be emphasised that this measurement will gauge progress towards the Strategy Targets only. It will deliver raw data indicating whether or not each sector is on-track to meeting its individual target in percentage terms. Secondary level indicators will be developed in order to establish the cause and effect of strategic interventions as part of the Energy Strategy Monitoring Plan.

6.10 Barriers to Targets

It is important to be aware of the potential barriers to the successful uptake and implementation of Energy Strategy Targets, as these should be anticipated and addressed before they arise:

- **Data.** The lack of adequate data to establish and monitor a target is an obvious barrier. The Municipality is addressing this barrier by developing more complex data collection systems for Greenhouse Gas emissions and energy usage across all sectors;
- **Target Credibility.** If end-users feel that the Targets are not achievable or that their sub-sector is somehow 'exempt' and therefore not bound to the Targets, research has shown that target obligations are often not met;
- **Human Resources and time.** Both these factors are critical in the supply of data, and in the data collection/interpretation process itself. This is a real and serious barrier, and shall be addressed within the Monitoring Action Plan.

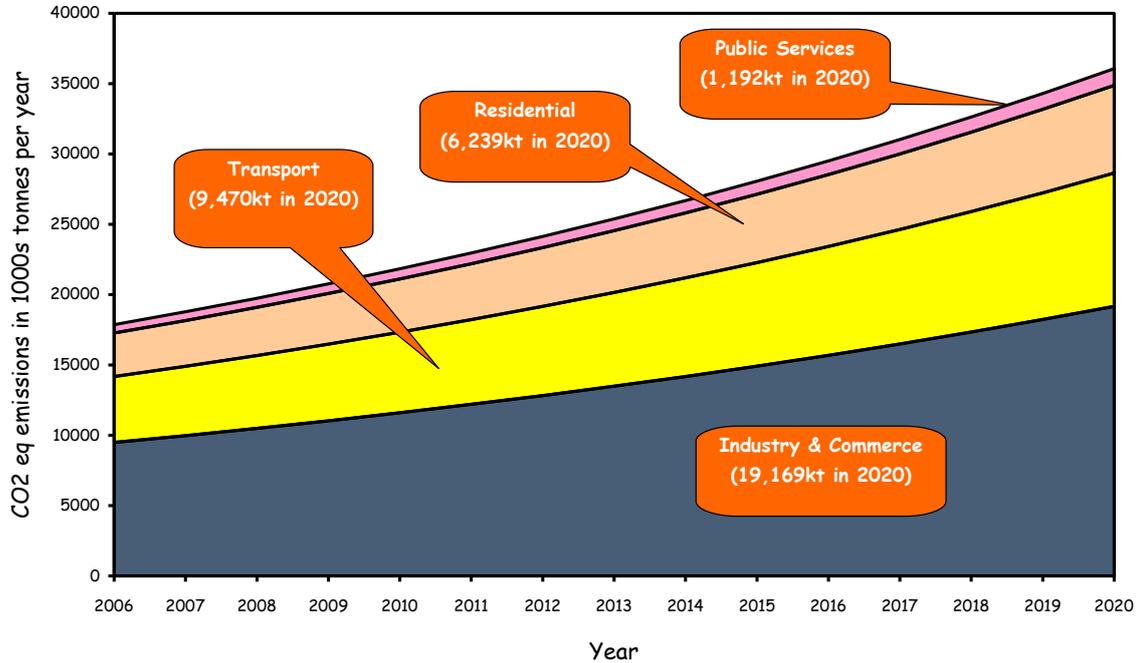
6.11 Summary of Targets

Figure 8 shows the forecast CO₂ emissions scenario for all sectors of the EMA over the coming 13 years, assuming a business-as-usual (BAU) scenario. The BAU assumptions are that energy growth will continue to increase at the current levels of economic growth (5.15% per annum) and that the existing energy mix will not alter significantly.



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Figure 8 Forecast BAU Annual CO₂ Emissions by Sector



Against the forecast shown in Figure 8, Targets have been identified for each of the sectors (Themes) based on anticipated savings achievable through National RE and EE Targets.

To summarise, the Targets for EMA are highlighted in Table 4:

Table 4 EThekweni Municipality Energy Strategy Target Summary

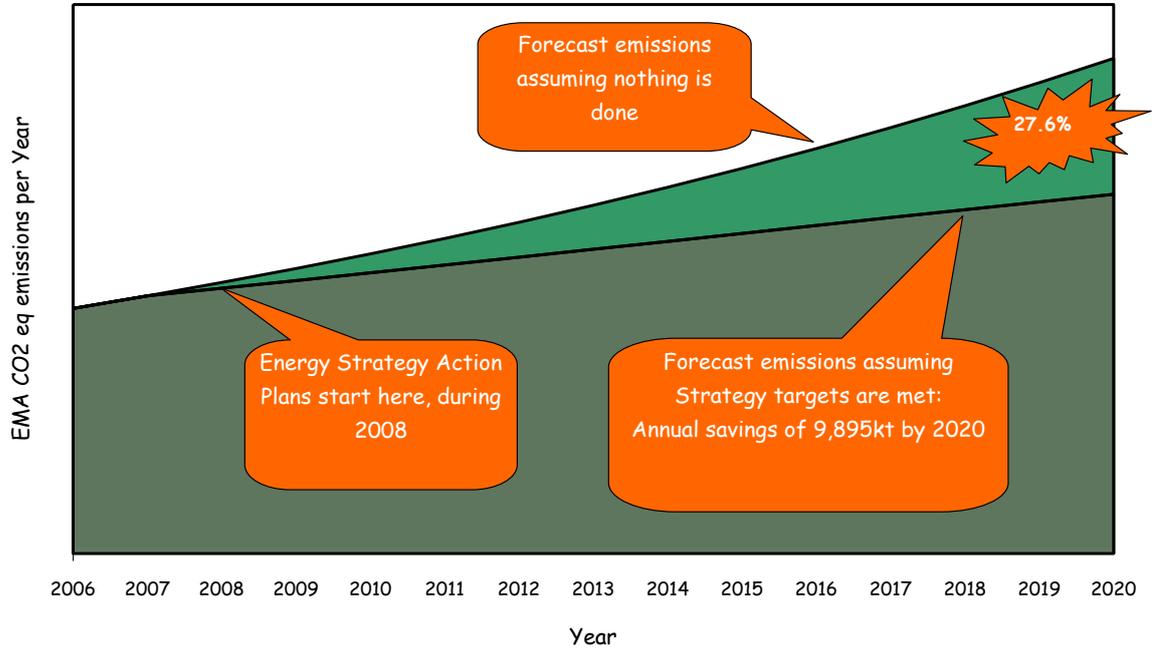
Theme	Sector	% CO ₂ Reduction by 2020	Annual Saving by 2020
A	Residential	24.5	1,530 kt CO ₂ equivalent
B	Local Authority & Public	33.0	357 kt CO ₂ equivalent
C	Industry, Commerce, Agribusiness	30.0	5,739 kt CO ₂ equivalent
D	Transport	24.0	2,269 kt CO ₂ equivalent
Totals		27.6	9,895 kt CO₂ equivalent

Figure 9 shows a simplified progression of how the overall EMA target of 27.6% will appear over time. The main points to note are the starting-point of strategy Action Plans during 2008, and the subsequent divergence of energy usage trends with and without Targets.



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Figure 9 How the Targets will look over time





7 Theme A: Residential

7.1 Sector Overview and Goal

The EMA domestic sector's annual energy use is calculated to be 15,819TJ, contributing 3,089,000 tones in CO₂ per annum as a direct result of electricity use and the combustion of fossil fuels⁸. It is estimated that 72% of households rely on electricity as their primary source of energy for lighting, heating and cooking.

Key to energy planning is access to sustainable and affordable energy to those 40% in the Municipality who are poor or ultra-poor. Research shows that poorer households spend proportionally more of their total income, approximately 13%, on energy provision than their wealthier counterparts.

As access to household electrical goods is restricted by cost, many low-income households rely on paraffin or fuel wood for cooking and candles for lighting. Respiratory ailments are a consistent feature in the use of these fuels. Poor indoor air quality resulting from the use of dirty fuels can be exacerbated by poorly designed and maintained combustion equipment and inadequate ventilation. Switching to a combination of cleaner fuels and efficient use of electricity mitigate these effects.

Energy efficiency is one of the most important ways in which we can impact on energy use and cost, however fundamental behavior change amongst higher income households is critical in improving energy efficiency. In order to alter what energies these households employ, reduce their energy use and create a critical mass in the market for cleaner and renewable forms of energy technology, awareness raising and incentives need to be provided by all three spheres of government.

Goal:

To encourage clean and sustainable domestic energy use to improve energy security and contribute towards the social health and welfare of communities throughout the EMA.

⁸ EtheKweni Municipality State of Energy Report, 2006



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7.2 Residential Sector Objectives

Environmental Objectives	
A1	Uptake of energy efficient practices and renewable alternatives increased <i>This is of particular importance within middle-income and higher-income households, where energy consumption is over four times that of poorer households. Greater awareness is required regarding the low-cost and no-cost opportunities for saving energy in households.</i>
A2	Use of dirty and inappropriate fuels reduced <i>The use of cleaner fuels should be encouraged to minimise the unnecessary use of polluting fuels in rural and peri-urban areas.</i>
A3	Impact of climate change reduced <i>The ongoing development and uptake of cleaner fuels and renewable energy technologies by all income groups will reduce GHG emissions.</i>
Economic Objectives	
A4	Access to affordable, clean and safe energy sources increased <i>Poorer households spend a higher proportion of their monthly income (approximately 13%) on energy provision for domestic use than their higher income neighbours. Better awareness and greater access to more appropriate energy would assist in alleviating this.</i>
A5	Development of the energy efficiency and renewable energy technology sectors encouraged <i>It is given that an uptake of energy efficiency practice and renewable energy technologies, contributes to building a profitable energy efficiency and renewable energy sector within the economy.</i>
Social Objectives	
A6	Use of inappropriate fuels reduced <i>The use of unsafe fuels and stoves in the household can be a significant contributor to poor health due to respiratory ailments and result in domestic fires. A switch to a combination of cleaner fuels, safe appliances and the efficient use of electricity will lessen these effects</i>
A7	Living standards improved <i>Improved living standards arise through better access to clean and affordable fuels, affordable electrical services and improved air quality, both inside and outside the living space.</i>
Institutional Objectives	
A8	Access to appliances which use clean and appropriate fuels improved <i>Barriers to the uptake of appropriate fuels and appliances amongst poorer communities must be removed.</i>
A9	General awareness of energy efficiency and renewable energy technologies improved <i>Householders need to become more aware of energy efficiency and renewable energy technologies. Institutional barriers to the use of efficient and renewable energy sources must be removed.</i>
A10	Formalised energy data collection protocols and guidelines introduced <i>Data associated with electricity use in households are readily available via existing invoicing and pre-pay metering systems. Data for other household energy sources are not well documented and statistics are based on spot surveys and ad hoc research. Meaningful energy data and energy indicators require collection protocols for long-term energy planning and monitoring.</i>



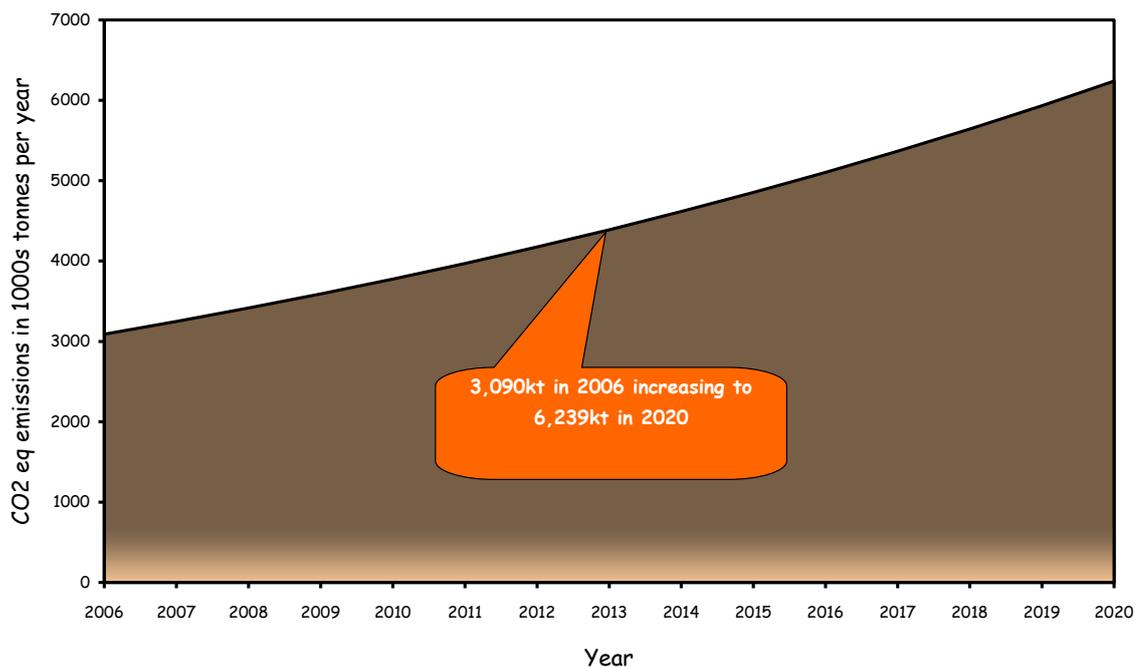
7.3 Residential Sector Target

BUSINESS AS USUAL

Assuming nothing is done, what will the annual CO₂ emissions become by 2020 for the Residential Sector in the EMA?

Figure 10 shows the forecast scenario for Housing & Residential Sector-related CO₂ emissions over the coming 13 years, assuming a business-as-usual (BAU) scenario. The BAU assumptions are that energy growth will continue to increase at the current levels of economic growth (5.15%⁹ per annum) and that the existing energy mix will not alter significantly.

Figure 10 EMA Residential Sector: Forecast BAU CO₂ Emissions



6,239kt per annum is the forecast CO₂ emission level for the Residential Sector by 2020.

⁹. Ethekewini Economic Development Unit communication 30th May 2007



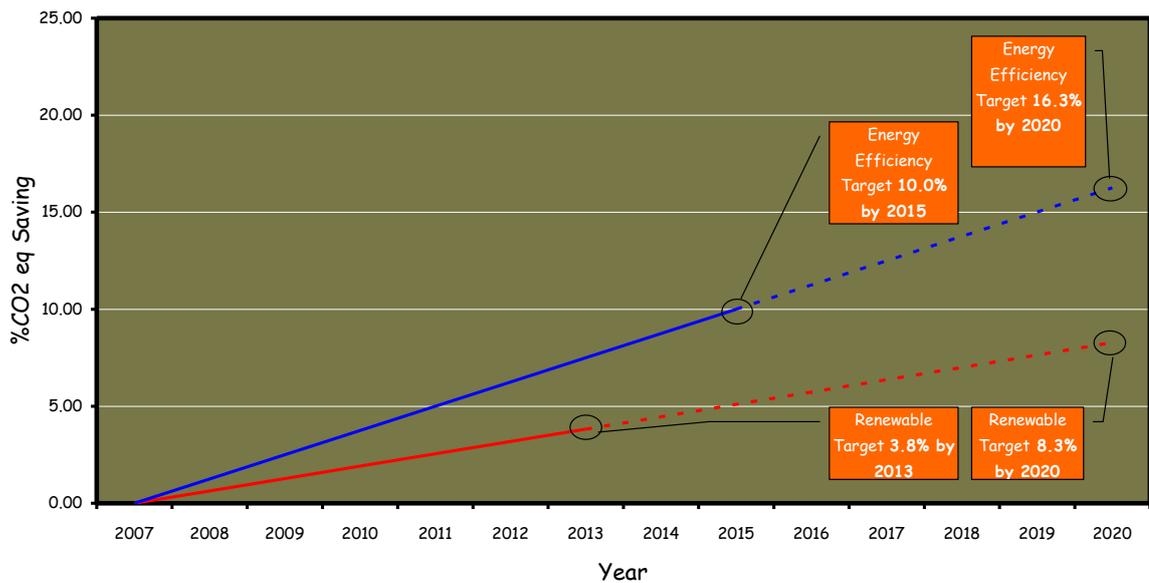
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THE TARGET

Assuming National RE and EE Targets are achieved, what would be the annual savings potential by 2020 if savings continue to be made at the same rate?

Figure 11 shows savings projections for RE and EE given the existing National Targets. The trend lines show EE savings (in blue) reaching 10% by 2015 and RE savings (in red) reaching 3.8%¹⁰ by 2013. Both lines are extrapolated on a straight-line basis to show the savings effect by 2020.

Figure 11 EMA Residential Sector: National Energy Targets applied to EMA



A total savings potential of 24.5% would be achieved by 2020 if National RE and EE Targets are met and savings continue at the same rate.

¹⁰. This is the 'all-energy' percentage CO₂ saving attributable to RE for this theme, given a 4% offset against electricity usage only, as stipulated in the RE White Paper



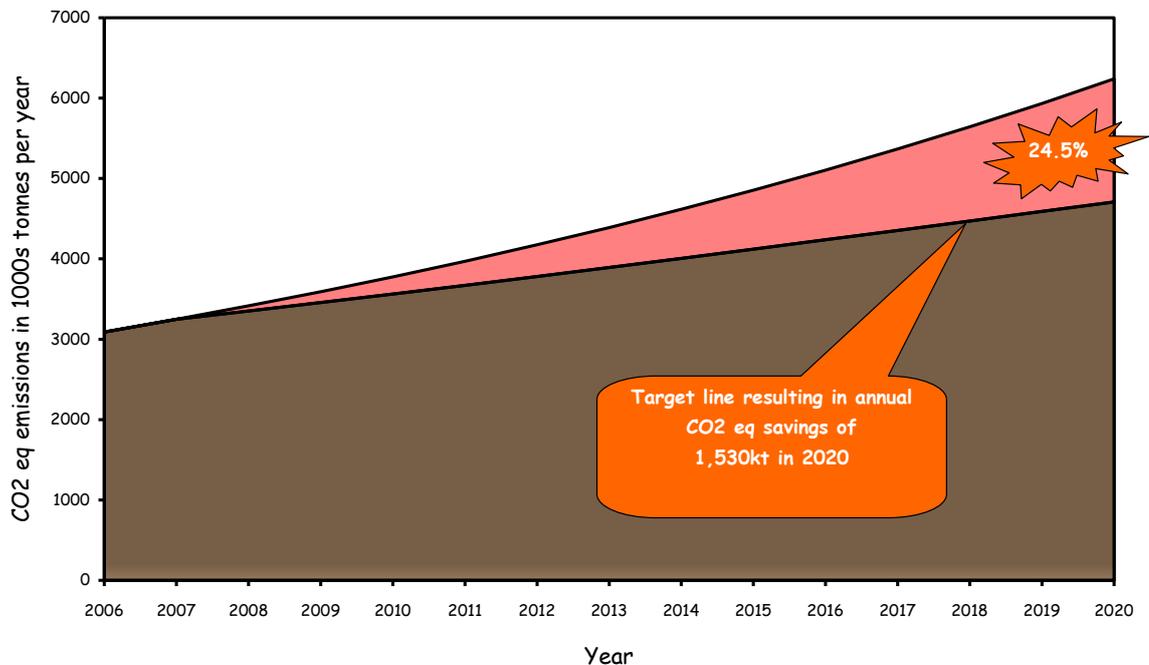
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THE OUTCOME

What effect would the target of 24.5% CO₂ savings for the Residential Sector have upon emissions by 2020?

Figure 12 shows the effect of the target on forecast BAU CO₂ emissions. The top line represents the BAU scenario as discussed above, whilst the lower line is shows the forecast CO₂ emissions if the target is met.

Figure 12 EMA Residential Sector: Target CO₂ Emissions Reduction



An annual saving of 1,530kt CO₂ would be achieved by 2020 in the Residential Sector if the savings target is achieved. The cumulative savings by 2020 would be over 8,870kt CO₂.



EThekwini Municipality Energy Strategy

7.4 Residential Sector Action Plans

Residential Sector Action Plan 1					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Energy Efficiency Standards for New Residential Buildings</p> <p>This Action Plan is intended to pre-empt the introduction of National EE Standards for domestic buildings by introducing a programme of awareness within selected sector stakeholders in the EMA.</p> <p>The new National standard, SANS283 Energy Efficiency Domestic Buildings Design, is currently being finalized and will be promulgated in due course. Roll-out of this standard for all new residential buildings will therefore become mandatory.</p> <p>EThekwini Municipality will be proactive in early adoption of the SANS283 requirements to ensure maximum benefit is derived at the earliest opportunity.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Liaise with SABS and DME regarding progress and process of new standard; • Ensure early adoption of the requirements of SANS283 in planning approval process; • Include mandatory Standards within an EE By-law; • Make requirements additional to SANS283 within a local by-law. These could include life-cycle assessments where embodied energy in building materials are accounted for as part of the sustainability assessment for new build commercial premises, etc; • Develop an awareness-raising programme which will be required by contractors and other professionals, such as architects and engineers; • Consider the use of pilot studies to assist with awareness-raising. 	<p>To contribute toward meeting Theme Objectives: A1, A5, A7 and A9</p>	<p>Short-term (<2 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Municipality Architecture & Buildings Department; • SABS; • DME; • DoH • 'Green' Architects • Buildings Developers 	<p>Included in savings target for Enhanced Energy Efficiency in the Home</p>



EThekweni Municipality Energy Strategy

Residential Sector Action Plan 2					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Green Domestic Power Tariffs</p> <p>This Action Plan intends to identify the potential market for Green Power, both now and into the future, and actively promote the concept to the Residential Sector.</p> <p>Green Power refers to electricity generated via renewable & sustainable means, which can be traded via Tradable Renewable Energy Certificates (TRECs) or other wheeling mechanisms, such that users may meet prescribed Carbon commitments, etc.</p> <p>The Green Power market within EMA currently has no external driving forces, although this may change in 2012 whereupon National Carbon targets could come into force under the Kyoto Protocol.</p> <p>Consideration will be given to the use of full-cost accounting in order to promote the benefits of Green Energy sources.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Establish the current market value of residential Green Power. An evaluation of the existing market will enable an assessment to be made of the immediate additional demand for RE within the EMA Sector; Promote Green Power as a sustainable energy source within the middle & high-income residential sector. Develop Green tariffs such that the option to purchase green power is made available to all end-users; Encourage the emergence of small-scale domestic auto-producers via the widespread application of two-way electricity metering; EThekweni Municipality to ensure its ongoing liaison with DME regarding future development of TREC systems and Green Tariffs in SA. 	<p>To contribute toward meeting Theme Objectives: A1, A3, A5 and A9</p>	<p>Market analysis: Immediate Roll-out: short-term (<2 years)</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Electricity Department; EThekweni Municipality Communications Department; EThekweni Municipality Treasury Department; EThekweni Municipality Consolidated Billing Department; DME RE Directorate; DoH; SABS; NERSA. 	<p>Market analysis required in order to confirm potential savings.</p>



EThekwini Municipality Energy Strategy

Residential Sector Action Plan 3					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promoting and Enabling Energy Efficiency in the Home</p> <p>1. Awareness-raising</p> <p>The Action Plan of Awareness-raising intends to develop and undertake a Municipality-wide campaign to all residential energy-users to promote the financial and environmental advantages of energy efficiency in the home.</p> <p>It will also help convey the intentions of the eThekwini Municipality Energy Strategy itself, its targets, goals, objectives, etc. as well as explore other mechanisms for awareness-raising, including schools competitions, "Green Residences" competitions and classification status for "Eco Estates".</p> <p>2. Use of Incentives and Disincentives</p> <p>This aspect of the Action Plan will formulate a suite of financial incentives and/or disincentives, which might include partial rates rebate according to the level of EE applied within the home, or comprise penalties should basic standards of efficiency not be met.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Collect existing relevant information on residential EE. This will include Best Practice documentation, BAT awareness documentation, case studies, studies carried out by DME, etc. • Invite and vet bids from local organizations able to provide EE and RE advice to residential households; • Establish a clearing-house, or regularly updated knowledge-base, where the public can access the various sources of information and obtain contact information for EE and RE qualified advisers; • Develop specific awareness raising strategies for EE and RE technologies. These may include: Poster campaigns, media coverage, the use of utility bills to carry "Energy Tips", etc. • Investigate and establish the basis for award of incentives via the rates system. Develop an appropriate "points" system, evaluation and audit methodologies, application process, etc. 	<p>To contribute toward meeting Theme Objectives: A5 & A9</p>	<p>Information gathering: Immediate (<1 year)</p> <p>Utility bill energy tips: Short-term (<2 years)</p> <p>Roll-out of incentives: Medium-term (2-5 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Municipality Housing Department; • EThekwini Municipality Communications Department; • EThekwini Municipality Architecture Department; • EThekwini Municipality Treasury Department; • EThekwini Municipality Consolidated Billing Department. • Energy Efficiency Service Providers; • DME; • Community groups. 	<p>Simple changes to domestic activities, such as Compact Fluorescent Lights (CFLs), have been shown to reduce total household energy usage by 10%. This is a conservative estimate and it is proposed that combining the use of incentives would increase this to 15%.</p> <p>Assuming success of the Solar Water Heater (SWH) programme, the forecast fossil-fuel derived Carbon output in the sector would be 5,050kt CO₂ equivalent per annum by 2020.</p> <p>A 15% target would yield savings of 757 CO₂equivalent per annum.</p>



EThekwini Municipality Energy Strategy

Residential Sector Action Plan 4					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Affordable and Safe Energy Provision to Ultra-poor Households</p> <p>This Action Plan intends to promote the safe use of paraffin appliances and to encourage fuel-switching to safer, cleaner alternatives via the use of transition fuels such as LPG.</p> <p>A large number of eThekwini households use paraffin, wood, coal and animal dung for cooking and heating. Although they represent less than a quarter of total households the numbers are still significant and represent an important opportunity to introduce transitional fuels for heating and cooking.</p> <p>Alternative energy sources which will be addressed by this action plan will include sustainably-produced gel-ethanol, bio-fuels from waste/sewage sludge, solar cookers, solar LED lighting, household energy generation, black-pipe water heaters, etc.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Investigate the option to re-allocate the Electricity Basic Support Services Tariff (ESBSST) to those end-users who are least able to afford the purchase of energy; Work with DME and SABS to publicize existing safety standards for domestic paraffin appliances; Carry out a feasibility study into implementation of a marketing and distribution system to bring cleaner fuels to the rural/peri-urban user base; Consider the phased removal of subsidies upon unsustainable fuels to promote the use of transition fuels, and ultimately clean fuels. 	<p>To contribute toward meeting Theme Objectives: A2, A4, A5, A6, A7, A8 and A9</p>	<p>Short-term (<2 years)</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; EThekwini Municipality Health Department; EThekwini Municipality Electricity Department; DME; SABS; SAPIA; Community Groups 	<p>Cannot be quantified without further research and development.</p> <p>Appropriate indicators will be developed for this Action Plan to enable progress tracking. These will be integrated into the broader Strategy Monitoring Plan</p>



EThekweni Municipality Energy Strategy

Residential Sector Action Plan 5					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Mandatory EE and RE Training and Certification for Utility Service Providers</p> <p>This Action Plan is intended to ensure that homeowners and buildings developers employ only utility service providers who have undertaken certificated EE and RE training. Training will be made mandatory for all utility services groups, such as plumbers, electricians, builders, construction workers, etc. They will receive certified EE&RE training including installation and maintenance of EE/RE technologies and materials to obtain a license to operate within the municipality.</p> <p>Certified training and guideline materials have already been developed by DME and SABS. These will ensure that all training in RE and EE is undertaken to consistently high standards. As an implementing instrument, subsidized energy efficiency training may be offered within utility services stakeholder groups.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Identify utility services stakeholder groups relevant to this action plan and collaborate with training providers to establish relevant training materials; Introduce a formal SETA certification process for participating artisans deemed to have met qualifying criteria. Courses given through universities would be automatically approved and a training course could be designed at UKZN (with input from the Municipality) to start training municipal employees as an pilot for the programme; Development of a certified EE utility service provider database, which can be publicized and made available to the general public; Training would be required for relevant municipal workers and for contractors who receive municipal tenders (this would be written in into standard Municipality tender invitation documentation). 	<p>To contribute toward meeting Theme Objectives: A1, A4, A5 and A9</p>	<p>Medium-term to long-term (>5 years)</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Architecture & Buildings Department; EThekweni Municipality Economic Development Unit; DME; SABS; Eskom; Local building services providers; SETA and training providers, educational establishments. 	<p>Included in savings target for Enabling and Promoting Energy Efficiency in the Home</p>



EThekwini Municipality Energy Strategy

Residential Sector Action Plan 6					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Household Appliance Energy Efficiency Labelling</p> <p>This Action Plan is intended to ensure that the maximum benefit is gained from EE labelling schemes for domestic appliances by promotion through the media, such as local TV and <i>Metro Beat</i>.</p> <p>The new Energy Label which has been adopted by DME to indicate energy efficiency is similar to the label used in European Union (EU) member states, with the EU flag replaced by the Energy Star.</p> <p>All products that are legally imported or produced in South Africa will carry the Energy Star, which will be visible in the bottom right-hand corner of the appliance label.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Participate in local publicity campaigns arranged via the DME, and undertake public awareness-raising via various media routes; Ensure that all new in-house purchases of such appliances meet with the highest efficiency standards; Engage with appliance stockists to encourage the promotion of domestic goods exceeding minimum EE standards. 	<p>To contribute toward meeting Theme Objectives: A1, A5, and A9</p>	<p>Short-term and ongoing</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; EThekwini Municipality Communications Department; Domestic Appliance Manufacturers; Domestic appliance stockists; Community Groups; SABS and DME. 	<p>Included in savings target for Enabling and Promoting Energy Efficiency in the Home</p>



EThekweni Municipality Energy Strategy

Residential Sector Action Plan 7					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Enhanced use of Solar Water Heating in the Home</p> <p>This Action Plan is intended to ensure maximum uptake of Solar Water Heating (SWH) within all residential properties where technically viable.</p> <p>Solar hot water systems are probably best-suited to high and middle-income properties with fairly high usage patterns and a monthly billing contract with the utility.</p> <p>For middle and high-income groups the option exists to facilitate the repayment of equipment purchase costs through the billing system. This would encourage families to choose systems that more accurately suited their needs and usage patterns.</p> <p>The use of solar hot water systems in low-income housing is probably the most cost-effective way of reducing the burden of high electricity bills for South Africa's most vulnerable populations.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> • Ensure all new housing stock utilizes SWH technology as a mandatory specification; • Establish an energy by-law to enable rapid roll-out and deployment of SWH systems throughout the EMA. This would include the mandatory replacement of malfunctioned electric geysers; • Short-list and recommend various financing options per income group. These may include pre-agreed repayments via electricity bills, and mechanisms involving varying levels of subsidies per income group. It is proposed that up to 100% subsidy could be made available for the poor; • The programme would initially focus on retrofitting existing formal housing. The roll-out of a similar programme for the Municipality's re-housing initiative would also be included; • SWH standards to be formalized and adopted. Ongoing liaison with SABS regarding mandatory standards. 	<p>To contribute toward meeting Theme Objectives: A1, A2, A3, A4, A5, A6 and A7</p>	<p>Establish legal basis for an energy by-law: Short-term (<2 years)</p> <p>Roll-out: Ongoing</p>	<ul style="list-style-type: none"> • EThekweni Municipality Energy Body; • EThekweni Municipality Housing Department; • EThekweni Municipality Electricity Department; • EThekweni Municipality Development Planning Department • ESKOM; • NERSA; • DoH; • DME; • SWH Service Providers; • Community groups; • CDM and Carbon Finance Service Providers. 	<p>The long-term objectives for SWH will be:</p> <ol style="list-style-type: none"> 1. For new-built houses: 100% 2. For retrofit in existing high-income housing: 100% 3. For retrofit in existing middle-income housing: 80% 4. For retrofit in existing low-income housing: 50% <p>The Strategy target is based upon 50% of all households being targeted for SWH conversion by 2020.</p> <p>The forecast CO₂ equivalent output per annum accountable to household electricity usage at that time is 5,958kt per annum, of which 2,383kt would be accountable to DHW production.</p> <p>Assuming 50% penetration of SWH, expected savings would be 1,190kt CO₂ equivalent per annum.</p>



8 Theme B: Local Authority and Public sector

8.1 Sector Overview and Goal

eThekweni Municipality controls many activities and functions within the EMA. The annual municipal budget for the 2006/07 Financial Year was approximately R14 billion and the Municipality employs in excess of 18,000 permanent staff members.

The functions which account for the majority of the local authority's energy use are as follows:

- Electricity for administrative and public buildings;
- Electricity for water and wastewater treatment;
- Electricity for streetlights; and
- Petrol and diesel for the municipal vehicle fleet.

Excluding its transport operations, eThekweni Municipality uses 2,388TJ annually throughout its administrative and utility service operations, almost exclusively in the form of electrical energy. Included in this total is the electricity distribution and transmission loss attributable to the entire power distribution network. The total, including losses, contributes in excess of 590,000 tonnes in CO₂ per annum to the GHG footprint of the EMA.

eThekweni Municipality has already taken the initiative in implementing energy improvements in some of its building stock initiated through the ICLEI: Local Governments for Sustainability, Cities for Climate Protection Programme. It has been demonstrated that a 15% savings is more than achievable through practical interventions, which include no cost and low cost options.

Goal:

To work towards the elimination of all global and local pollutants arising from energy use within eThekweni Municipality's own activities, as well as throughout the wider EMA, thereby promoting sustainable energy use and production across all sectors.



EThekweni Municipality Energy Strategy

8.2 Local Authority and Public Sector Objectives

Environmental Objectives

B1 Pollution Management and Waste Management improved

To have a sustainable, clean and healthy Municipal environment through an integrated system of pollution and waste management that works towards achieving zero waste.

B2 Impact of climate change reduced

The ongoing development and uptake of cleaner fuels and renewable energy technologies by all income groups will reduce GHG emissions.

Economic Objectives

B3 Municipality operational overheads minimised

By optimising energy efficiency and renewable energy technologies, the Municipality will minimise its operational overheads. This will serve as an example to other sectors, as well as ensure greater efficiency of public service delivery.

B4 Economic growth and job creation promoted

Climate change will result in infrastructure damage, compromised resource availability (i.e. water), decreases in agricultural outputs and reduced tourism amongst other impacts. The Municipality should encourage sectors, which develop mitigation and adaptation technologies and programmes. These new areas of economic growth will create jobs and should be strongly supported by the Municipality.

Social Objectives

B5 Promote Health and Safety

To ensure the delivery of a safe and healthy living, working, recreational and built environment for the population of the EMA through effective management of its energy resources.

B6 Promote Sustainable Service Delivery

Threats to quality of life brought about by climate change may include reduced availability of food and drinking water, loss of free environmental goods and services, infrastructure damage and coastal erosion, as well as increased health impacts. This will impact on the Municipality's ability to ensure a sustainable supply of quality services. Greater awareness of the relationship between energy use, climate change and service delivery must be promoted.

Institutional Objectives

B7 Promote and encourage energy efficiency and renewable energy technologies

Identify and remove the institutional barriers facing the wider uptake of energy efficiency and renewable energy technologies and introduce incentives for sustainable energy use in the long term.

B8 Promote efficient land-use planning

Encourage appropriate densification and reduce urban sprawl in order to maximise existing energy and other municipal infrastructure and minimise the development footprint. Employ nodal planning principles to promote efficient transport use. Locate common land-use activities appropriately so as to create opportunities for shared energy supply.

B9 Enhance public education and awareness

To create a culture of learning about energy, energy efficiency and climate change, enabling the effective participation of all in managing, understanding and appreciating the environment. This objective should be achieved by a combination of education, awareness-raising and active demonstration programmes.

B10 Formalised energy data collection protocols and guidelines introduced

The Municipality must be responsible for managing data collection and processing as integral to its development and assessment of energy planning and target achievement. The Municipality must also be the lead agent in an auditing and monitoring programme so that any strategic interventions can be introduced to achieve these energy targets.



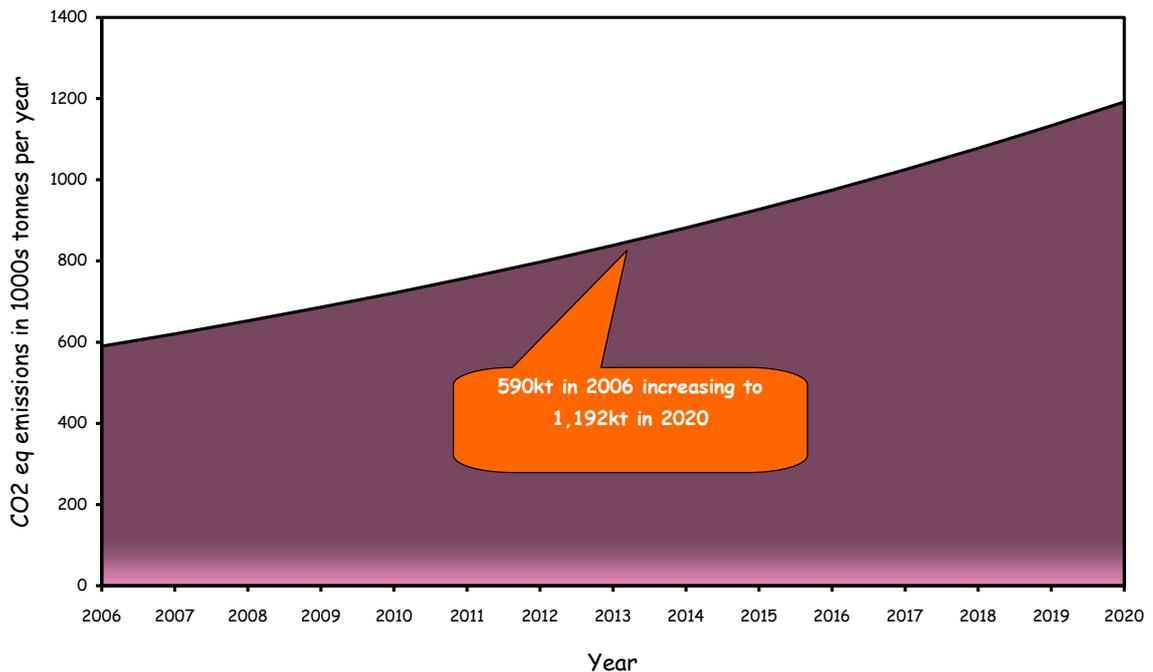
8.3 Local Authority and Public Sector Target

BUSINESS AS USUAL

Assuming nothing is done, what will the annual CO₂ eq emissions become by 2020 for the Public Sector the EMA?

Figure 13 shows the forecast scenario for Local Authority and Public Sector-related CO₂ eq emissions over the coming 13 years, assuming a business-as-usual (BAU) scenario. The BAU assumptions are that energy growth will continue to increase at the current level of economic growth (5.15%¹¹ per annum) and that the existing energy mix will not alter significantly. The forecast BAU CO₂ eq emissions curve shown below allows for 5.15% year-on-year "compound growth" between 2006 and 2020.

Figure 13 EMA Local Authority & Public Sector: Forecast BAU Annual CO₂ Emissions



1,192kt per annum is the forecast CO₂ eq emission level for the Public Sector by 2020.

¹¹. EThekweni Economic Development Unit communication 30th May 2007



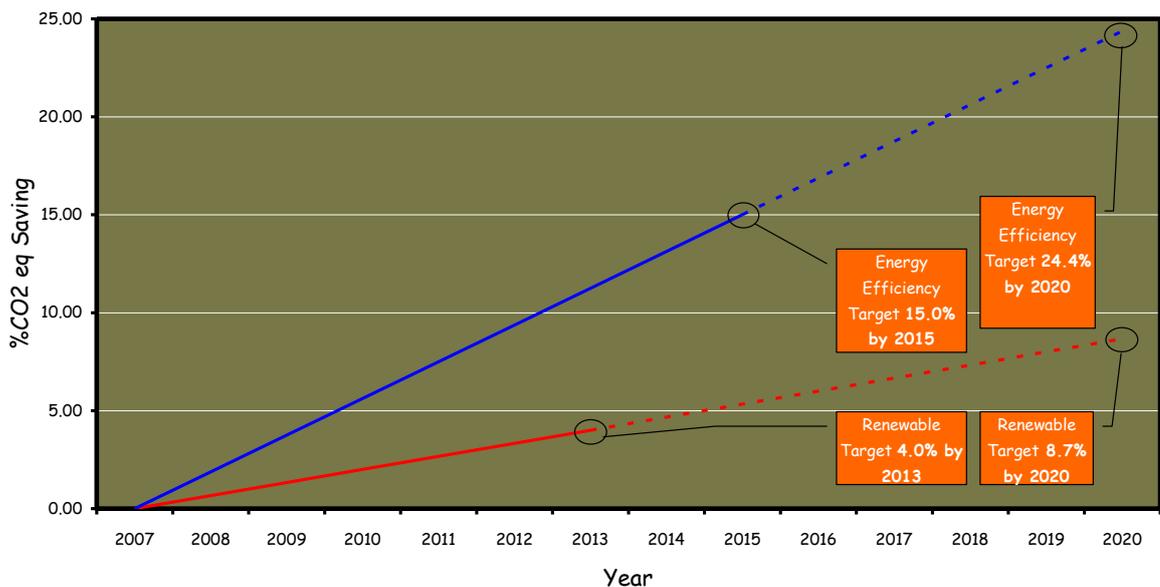
EThekweni Municipality Energy Strategy

THE TARGET

Assuming National RE and EE Targets are achieved, what would be the annual savings potential by 2020 if savings continue to be made at the same rate?

Figure 14 shows savings projections for RE and EE given the existing National Targets. The trend lines show EE savings (in blue) reaching 15% by 2015 and RE savings (in red) reaching 4%¹² by 2013. Both lines are extrapolated on a straight-line basis to show the savings effect by 2020.

Figure 14 EMA Local Authority & Public Sector: National Energy Targets Applied to EMA



A total savings potential of 33% would be achieved by 2020 if National RE and EE Targets are met and savings continue at the same rate.

¹² This is the percentage CO₂ eq saving attributable to RE for this theme: 4% offset against electricity usage only, as stipulated in the RE White Paper as the Local Authority sector's use of other fossil based fuels is limited.



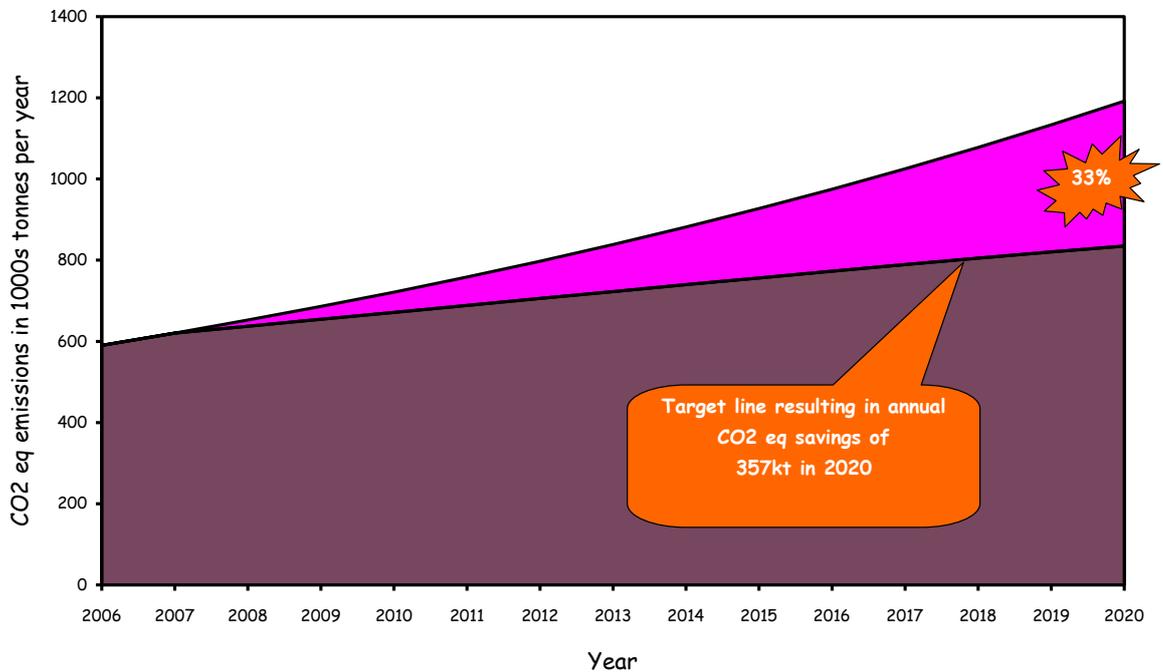
EThekweni Municipality Energy Strategy

THE OUTCOME

What effect would the target of 33% CO₂ eq savings for the Local Authority and Public Sector have upon emissions by 2020?

Figure 15 shows the effect of the target on forecast BAU CO₂ eq emissions. The top line represents the BAU scenario as discussed previously, whilst the lower line shows the forecast CO₂ eq emissions if the target is met.

Figure 15 EMA Local Authority & Public Sector: Target CO₂ Emissions Reduction



An annual saving of 357kt CO₂ would be achieved by 2020 in the Public Sector if the savings target is achieved. The cumulative savings by 2020 would be over 2,060kt CO₂.



EThekweni Municipality Energy Strategy

8.4 Local Authority & Public Sector Action Plans

Local Authority & Public Sector Action Plan 1					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Plan with all Public Sector Authorities</p> <p>This Action Plan intends to sustain the ongoing liaison with all spheres of Government to develop sub-sector specific plans for EE and RE implementation. Appropriate Departments will be identified at National and Provincial levels.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Formalize contacts with DME and KZN Provincial Government; Liaise with DME regarding National plans and EE/RE strategy developments; Liaise with Province regarding roll-out plans for EE and RE in Schools and Hospitals falling within their jurisdiction. 	<p>To contribute toward meeting Theme Objectives: B6, B8</p>	<p>Ongoing</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; Provincial Government (Health, Education, DAEA); National Government (DME, DEAT). 	<p>Energy savings cannot be quantified prior to the formulation of specific programmes.</p>



EThekwini Municipality Energy Strategy

Local Authority & Public Sector Action Plan 2					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Introduce EE Standards for New Public Buildings</p> <p>The Action Plan intends to ensure that eThekwini Municipality is proactive in early adoption of the SANS204 requirements, thereby ensuring maximum benefit is derived at the earliest opportunity.</p> <p>The new National standard, SANS204 Energy Efficient Buildings Design, is currently being finalized and will be promulgated in due course. Roll-out of this standard for all new public buildings will become mandatory;</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Liaise with SABS and DME regarding progress and process of new standard; • Pursue early adoption of standard's requirements in planning approval process; • Consider revising its own building codes to stipulate that SWH must be included as an option in new Public Sector buildings and hostels owned by the Municipality, and that architects/engineers must demonstrate that they have considered this and included or excluded it on the basis of a realistic analysis including subsidy options; • Carry out awareness raising programmes for buildings development professionals. Consider the use of case study material for this purpose. 	<p>To contribute toward meeting Theme Objectives: B1, B2, B3, B5 and B7</p>	<p>Short-term (<2 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Municipality Buildings & Architecture Department; • EThekwini Municipality Development Planning Department; • EThekwini Municipality Environmental Management Department; • SABS; • DME; • Private sector (construction and architecture). 	<p>Included in savings for Municipal Buildings Energy Audits Action Plan, above.</p>



EThekwini Municipality Energy Strategy

Local Authority & Public Sector Action Plan 3					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Municipal Building Energy Audits and Savings Implementation</p> <p>This Action Plan intends to deliver an additional survey process to check and confirm the realistic requirements for Domestic Hot Water Services (DHWS) within all public buildings. The objective would be to minimize and eliminate this electricity load where possible.</p> <p>Energy Audits provide a snapshot of energy consumption within a given timeframe and can be used to identify areas of wastage and, therefore, savings potential. EThekwini Municipality conducted pilot energy audits during 2005-2006 and this Action Plan will initiate a systematic approach to savings identified. Included in the Action Plan is the complete roll-out of the energy auditing programme to all Municipality-owned public buildings.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Carry out initial review to establish implementation progress to date; Appoint an internal lead agency to ensure the sustainability of the EE initiative; Appoint an Audit Task-team responsible for carrying-out/overseeing the remainder of the buildings energy surveys; Identify a priority list of buildings to be audited and a realistic timeline for completion; Assess availability of funding sources to carry out the higher-cost savings opportunities already identified. Capital costs for implementation of EE interventions in buildings to be factored into long-term planning; Undertake implementation of all viable savings opportunities within pre-defined payback criteria; Make available appropriate and tested energy savings calculations models to buildings managers and auditors. 	<p>To contribute toward meeting Theme Objectives: B1, B2, B3, B6 and B7</p>	<p>Completion of low cost options within the medium-term (2-5 years) Completion of higher cost options by 2020</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; EThekwini Municipality Electricity Department; EThekwini Municipality Buildings & Architecture Department. 	<p>Of the audits carried out to date, the collective simple payback on all recommendations identified is 2 years and the simple payback on all low cost measures is achieved collectively within 12 months. The total energy saving identified is equivalent to 19% of the combined annual energy usage of the buildings. Considering the low-cost and no-cost opportunities alone, the annual saving is equivalent to 6% of the combined buildings' energy usage.</p> <p>Forecast BAU Carbon output of Municipal buildings is 60kt CO₂ equivalent by 2020.</p> <p>6% low-cost savings are targeted, together with an additional 13% savings requiring capital expenditure.</p> <p>The total savings targeted will be 11kt CO₂ equivalent per annum.</p>



EThekwini Municipality Energy Strategy

Local Authority & Public Sector Action Plan 4					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Capacity Building in EE</p> <p>This Action Plan intends to continue the development, preparation and dissemination of information materials on energy efficiency to all Municipal Departments.</p> <p>Capacity Building and Awareness-raising are considered key to the success of the Energy Strategy and shall be prioritized via senior staff members and Heads of Department, via the Energy Body.</p>	<p>EThekwini Municipality to</p> <ul style="list-style-type: none"> Nominate a political champion for EE within the Municipality; Develop awareness materials for internal and external use, case studies and details of flagship projects; Continue awareness raising activities such as competitions and quizzes; Roll-out <i>Energy Efficiency Floors</i> to other Municipal buildings, together with nomination of buildings Energy Champions; Introduce an internal EE Best Practice award scheme; Ensure regular reporting mechanisms are put in place to monitor progress of awareness raising activities; Ensure that Energy Efficiency performance becomes part of staff KPIs where deemed most appropriate; Introduce Effective Monitoring & Targeting, thereby ensuring transparency of savings and providing meaningful feedback to staff. 	<p>To contribute toward meeting Theme Objectives: B6, B7, B9 and B10</p>	<p>Immediate and Ongoing</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; EThekwini Municipality Communications Department. EThekwini Municipality Mayors Office; EThekwini Municipality HODs. 	<p>An overall improvement in efficiency of 10% as a result of these in total is considered an achievable target figure for Buildings and Water & Sanitation energy usage combined.</p> <p>Total savings targeted will be 12kt CO₂ equivalent per annum</p>



EThekweni Municipality Energy Strategy

Local Authority & Public Sector Action Plan 5					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promote Sustainable Point-of-use Power Generation Projects</p> <p>This Action Plan is intended to ensure that all sustainable point-of-use power generation opportunities within Municipality-owned operations are considered. These considerations will include options for co-generation as potentially relevant to the Wastewater Treatment sub-sector, where anaerobic digestion is carried out.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Continue to identify further potential for biogas-driven co-generation in future, as well as other Combined Heat and Power opportunities; Build and strengthen in-house capacity to carry out feasibility, design and project management of co-generation projects. 	<p>To contribute toward meeting Theme Objectives:</p> <p>B6</p>	<p>Ongoing</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Water & Sanitation Department. Eskom EEDSM 	<p>Energy savings cannot be quantified without detailed scoping surveys.</p>



EThekweni Municipality Energy Strategy

Local Authority & Public Sector Action Plan 6					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promote Green Power Purchases</p> <p>This Action Plan is intended to ensure that all publicly owned buildings will be mandated to purchase a percentage of Green power in preference to traditional (fossil fuel) electricity sources.</p> <p>Green Power refers to electricity generated via renewable & sustainable means, which can be traded (via TRECs or other wheeling mechanisms) such that users may meet prescribed Carbon commitments, etc.</p> <p>The Green Power market within EMA currently has no external driving forces, although this may change in 2012 whereupon National Carbon targets could come into force under the Kyoto Protocol.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Undertake a feasibility study as an initial step. This will include the following: <ol style="list-style-type: none"> A review of the legal basis upon which the council could be mandated to undertake preferential purchase of energy from renewable sources; Establishing dialogue with existing IPPs to determine the marginal costs associated with RE provision to all municipality-owned operations; Assess further development of this initiative upon completion of the feasibility stage; Continue to track National Green Tariff development progress via Eskom and NERSA. 	<p>To contribute toward meeting Theme Objectives: B2, B4, B6 and B7</p>	<p>Feasibility complete within 2-5 years</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Electricity Department; DME RE Directorate; IPPs; Eskom; NERSA. 	<p>Target the following users to purchase a minimum of 25% electricity supply from renewable sources:</p> <ul style="list-style-type: none"> Public Buildings; Water and Sanitation; Street-lighting. <p>These combined have a forecast 2020 BAU Carbon output of 298kt CO₂ equivalent per annum. Assuming the Strategy EE Actions Plans are successful, this would reduce to 260kt per annum.</p> <p>Total savings targeted will be 65kt CO₂ equivalent per annum</p>



EThekwini Municipality Energy Strategy

Local Authority & Public Sector Action Plan 7					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Undertake Carbon Financing Projects</p> <p>This Action Plan is intended to ensure continuance of the evaluation of Landfill Gas generation options on existing sites, via the CDM (or other relevant financing mechanisms post 2012);</p> <p>The Action Plan will also ensure that eThekwini Municipality continues to evaluate other alternative power generation options into the future. These would include a range of renewable energy technologies as deemed technically and financially feasible.</p> <p>EThekwini Municipality has been at the forefront of CDM development in Southern Africa by developing three Landfill gas-to-electricity projects under the jurisdiction of eThekwini Cleansing and Solid Waste. The brokering of a purchasing arrangement for the Certified Emission Reductions (CERs) generated from these projects was a first for South Africa.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Maintain close liaison with CDM contractors and consultants; • The emphasis for waste management into the future will follow the accepted <i>Waste Management hierarchy</i>; • Options to generate Methane will be minimized and interventions such as composting will be promoted in its favour; • Build and strengthen in-house capacity to carry out feasibility, design and project management of CDM projects. 	<p>To contribute toward meeting Theme Objectives: B6</p>	<p>Ongoing</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Cleansing and Solid Waste; • DCM and Carbon Management Service Providers; • Landfill Gas (LFG) contractors and consultants; • Renewable energy contractors and consultants; • DME and the Designated National Authority (DNA). 	<p>Energy savings cannot be quantified without detailed feasibility study of projects identified.</p>



EThekwini Municipality Energy Strategy

Local Authority & Public Sector Action Plan 8					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Maximise Water Pumping Efficiency</p> <p>This Action Plan intends to undertake complete pumping efficiency survey of all Municipality-owned pumping stations and initiate a programmatic energy efficiency retrofit where financially viable. It will go on to ensure that all new pumping installations meet minimum EE standards, to be mandated by eThekwini Water & Sanitation Department.</p> <p>The water supply system comprises several energy components of which pumping is the most significant in energy usage terms. As water pumping efficiencies typically range between 30-70%, it is often viable to significantly improve upon this performance by the retrofit of Variable Speed Drive (VSD) technology and/or High Efficiency Motors (HEMs).</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Compile a wastewater pumping-station EE survey target list; • Invite competitive bids to undertake energy surveys on pumping stations; • Roll-out EE recommendations undertaken on a savings priority basis. The ongoing use of EEDSM funding may prove the most cost-effective route to ensure continuity of this programme; • Draft an EE Standard for pumping stations which will be made mandatory within a Municipal energy by-law. 	<p>To contribute toward meeting Theme Objectives: B2, B3, B6 and B7</p>	<p>Surveys complete: Short-term (<2 years)</p> <p>Roll-out: Medium-term to long-term</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Municipality Water & Sanitation Department; • Eskom EEDSM Programme; • ESCOs 	<p>A savings target of 5% efficiency improvement within the overall Water & Sanitation electricity usage forecast by 2020. The BAU Carbon emissions would be 64kt CO₂ equivalent per annum.</p> <p>Total savings to be targeted will be 3kt CO₂ equivalent per annum</p>



EThekwini Municipality Energy Strategy

Local Authority & Public Sector Action Plan 9					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Roll-out EE Street-lighting and Traffic-signals</p> <p>This Action Plan is intended to continue the existing programme of EE street-lighting and LED traffic signal retrofits within the EMA.</p> <p>There are 718 traffic signal stations in eThekwini Municipality comprising a total of 50,000 incandescent Tungsten-filament bulbs, of which 30,000 are illuminated at any given time.</p> <p>EThekwini Transportation Authority has undertaken a pilot project to replace the incandescent fittings with Light Emitting Diodes (LED) at the traffic signals in Argle Road and Stanger Street. The result was a 73% reduction in electricity use for this area.</p> <p>The signals have also shown a marked improvement in visibility and reliability, as well as reduced maintenance.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Establish a task-team to oversee the complete roll out of the lighting and LED retrofits over an agreed timescale; Track technical developments and costs of alternative street-lighting options as they arise; Establish the funding mechanism by which these programmes would be implemented in order to fast-track. This could be either: <ol style="list-style-type: none"> Roll-out using an ESCO accredited by Eskom, utilizing the Demand Side Management (DSM) programme to recover up to 50% of the project costs for energy efficiency improvements. Gradual roll-out using 100% funding from the Municipality's own maintenance budget. 	<p>To contribute toward meeting Theme Objectives:</p> <p>B1, B2, B3, B4, B5, B6 and B7</p>	<p>Task-team: Short-term (<2 years)</p> <p>Roll-out: Medium-term (2-5 years)</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; EThekwini Municipality Transport Authority; EThekwini Municipality Electricity Department; 	<p>Traffic signals: The Municipality-wide energy load saving arising from 100% retrofit would be 1.56MW, accompanied by carbon savings in excess of 12kt CO₂ equivalent per annum.</p>



EThekwini Municipality Energy Strategy

Local Authority & Public Sector Action Plan 10					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Maximize use of Solar Water Heating in Public Buildings</p> <p>This Action Plan is intended to ensure that all new public buildings and all retrofit DHW systems consider SWH as the <i>Technology-of-choice</i> wherever it is deemed technically viable.</p> <p>The use of SWH in eThekwini's Public Building stock may provide significant potential for energy savings in circumstances where the building layout facilitates the use of this technology. Detailed evaluation will be necessary such that any recommendations are tailored to each building's unique design, energy usage pattern and location.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Undertake a complete re-evaluation of the City's own building stock to identify types of buildings wherein SWH may be viable; Consider the introduction of an Energy by-law to mandate the use of renewable energy supplies for DHWS provision. 	<p>To contribute toward meeting Theme Objectives: B1, B2, B3, B4, B5, B6 and B7</p>	<p>Evaluation: Short-term (<2 years) Roll-out: Ongoing</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; EThekwini Municipality Buildings & Architecture Department; EThekwini Municipality Electricity Department; EThekwini Municipality Legal Department; ESKOM; ESCOs. 	<p>Energy savings cannot be quantified prior to detailed buildings surveys.</p>



EThekwini Municipality Energy Strategy

Local Authority & Public Sector Action Plan 11					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Maximize use of Energy Efficient Lighting in Public Buildings</p> <p>This action plan intends to formalize the process of EE lighting retrofit into standard working practice to ensure that maximum benefits are achieved at the earliest opportunity.</p> <p>The benefits of EE lighting are well documented and the Municipality has already made significant headway in its retrofit plan.</p> <p>As part of this Action Plan the eThekwini Municipality will investigate opportunities and options for the safe disposal of fluorescent light-bulbs for consumers generally.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Undertake a complete evaluation of the city's own building stock to prioritize buildings where the use of energy efficient lighting systems would be most cost-effective; Establish a task-team to oversee the complete roll out of the lighting retrofit over an agreed timescale; Establish the funding mechanism by which the programme would be implemented. This could be either: <ol style="list-style-type: none"> Roll-out using an ESCO accredited by Eskom, utilizing the DSM programme to recover up to 50% of the project costs for energy efficiency improvements; Or, Gradual roll-out using 100% funding from the Municipality's own maintenance budget. 	<p>To contribute toward meeting Theme Objectives:</p> <p>B1, B2, B3, B4, B5, B6 and B7</p>	<p>Evaluation: Short-term (<2 years)</p> <p>Roll-out: Medium-term (2-5 years)</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; EThekwini Municipality Buildings & Architecture Department; EThekwini Municipality Electricity Department; DEAT; ESKOM; ESCOs. 	<p>Included in savings for Municipal Buildings Energy Audits Action Plan (Action Plan 3).</p>



9 Theme C: Industry, Commerce & Agribusiness

9.1 Sector Overview and Goal

At 47% of total energy end-usage, the combined industrial, commercial and agribusiness sectors account for in excess of 76,900TJ per annum via a combination of secondary and primary energy usage. The global environmental influence of industrial electricity usage is significant, such that this translates into 53% of all energy-dependent CO₂ emissions within EMA, at over 9,490,000tonnes per annum.

The National Energy Efficiency Strategy has correctly identified the industrial sector as the single most influential sector in terms of energy savings potential. South Africa has a legacy of low energy prices and a history of high energy intensity within its main industrial sub-sectors. Industry should, therefore, continue to be a focus-point for energy issues in the EMA, and although headway has already been made in some sectors to improve energy efficiency, there is still scope for improvement. Several energy efficiency demonstration programmes have successfully illustrated the fact that huge savings can be made at very little capital cost.

One of the underlying issues regarding energy usage in this sector is that of data availability, or lack of it. Much of the relevant sector information is held within individual organisations, making access troublesome. The necessity for a consolidated energy database for the EMA has already been mentioned, and nowhere is the requirement more pressing than in the industrial and commercial sectors. Integral with the development of this database would be the acquisition of sectoral activity data against which future energy usage could be normalised and therefore be of use for targeting purposes.

Goal:

To support the application of energy efficiency and renewable energy technologies in the industrial, commercial and agricultural sectors to work towards the elimination of net GHG emissions and all other energy-related atmospheric pollutants.



eThekweni Municipality Energy Strategy

9.2 Industrial, Commercial & Agribusiness Sector Objectives

Environmental Objectives

C1 Local air quality improved

Some of Durban's largest industrial installations have wide local and regional impacts. Local emissions of oxides of Sulphur and Nitrogen, as well as smoke emissions, can be minimised by a combination of energy efficiency, fuel substitution and flue gas scrubbing. Of these options, the most accessible and cost effective is the application of energy efficiency practice and renewable energy technology and good energy management.

C2 Impact of climate change reduced

The ongoing development and uptake of cleaner fuels and renewable energy technologies by all income groups will reduce GHG emissions.

Economic Objectives

C3 Development of the energy efficiency and renewable energy technology sector encouraged

An uptake of energy efficiency practice and renewable energy technology in industry, contributes to building a profitable sector within the economy.

C4 Industrial competitiveness improved

Improved efficiency of operations and manufacture through the efficient use of energy and renewable energy technology has a direct impact on the profitability of industry, enhancing the competitive advantage of eThekweni's Municipality's industrial base. Achieving global production standards and global environmental performance standards ensures competitive access to international markets. Local government has a key role to play as innovator and must provide incentives and remove barriers to international competition.

Social Objectives

C5 Sustainable job creation

Efficient business is healthy business and the potential for sustainable commercial development within the EMA should be acknowledged and promoted, especially in the emerging markets such as energy efficiency and renewable energy technology.

C6 Health and welfare of communities improved

This links with Objective C1 in terms of the health effects of local air quality and local communities.

Institutional Objectives

C7 Awareness of Energy Efficiency improved and expanded

While energy efficiency and renewable energy technologies are greatly enhanced with modest capital outlay, the slow uptake of energy efficiency and renewable energy campaigns across this sector, suggests that awareness could be improved significantly. The thrust should be on heightening awareness via actions and demonstration programmes, together with identification and removal of institutional barriers where they exist.

C8 Communication with National Government regarding NEES objectives and targets prioritised

The links between Local Government and National Government initiatives need to be strengthened and conflict reduced. It is vital that Local Government programmes and interventions are informed and integrated with those of the DME, NDoT, DEAT and other relevant National Departments involved with energy utilisation, as indicated in the National Renewable White Paper, 2003.

C9 Formalised energy data collection protocols and guidelines introduced

Although the high-level data associated with electricity use in industry, commerce and agribusiness are readily available via existing invoicing systems, the more detailed and disaggregated data per sub-sector are not. Furthermore, data for other sources are not well documented and usage statistics are frequently problematic to source. In order to make meaningful use of energy data and energy indicators, reliable and verifiable data will be necessary for all forms of energy usage and for other sector variables.



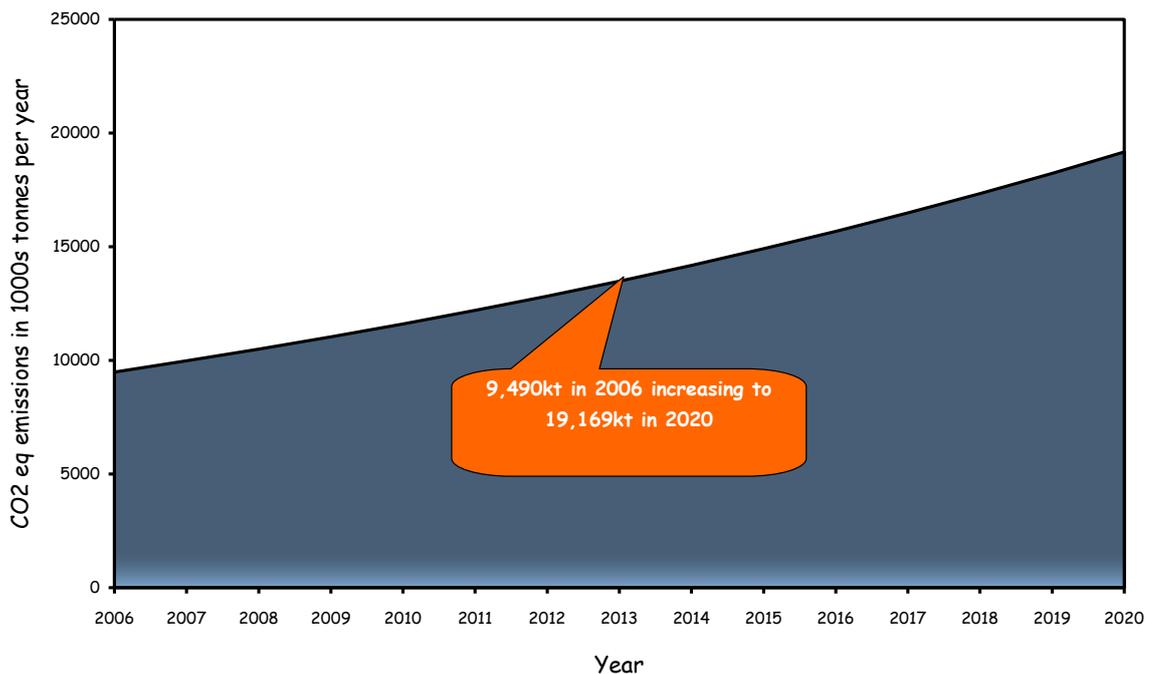
9.3 Industrial, Commercial & Agribusiness Sector Target

BUSINESS AS USUAL

Assuming nothing is done, what will the annual CO₂ emissions become by 2020 for Industry, Commerce & Agribusiness the EMA?

Figure 16 shows the forecast scenario for industry- and commerce-related CO₂ emissions over the coming 13 years, assuming a business-as-usual (BAU) scenario. The BAU assumptions are that energy growth will continue to increase at the current levels of economic growth (5.15% per annum¹³) and that the existing energy mix will not alter significantly.

Figure 16 EMA Industry, Commerce & Agribusiness Sector: Forecast BAU CO₂ Emissions



19,169kt per annum is the forecast CO₂ emission level for industry and commerce by 2020.

¹³. EtheKweni Economic Development Unit communication 30th May 2007



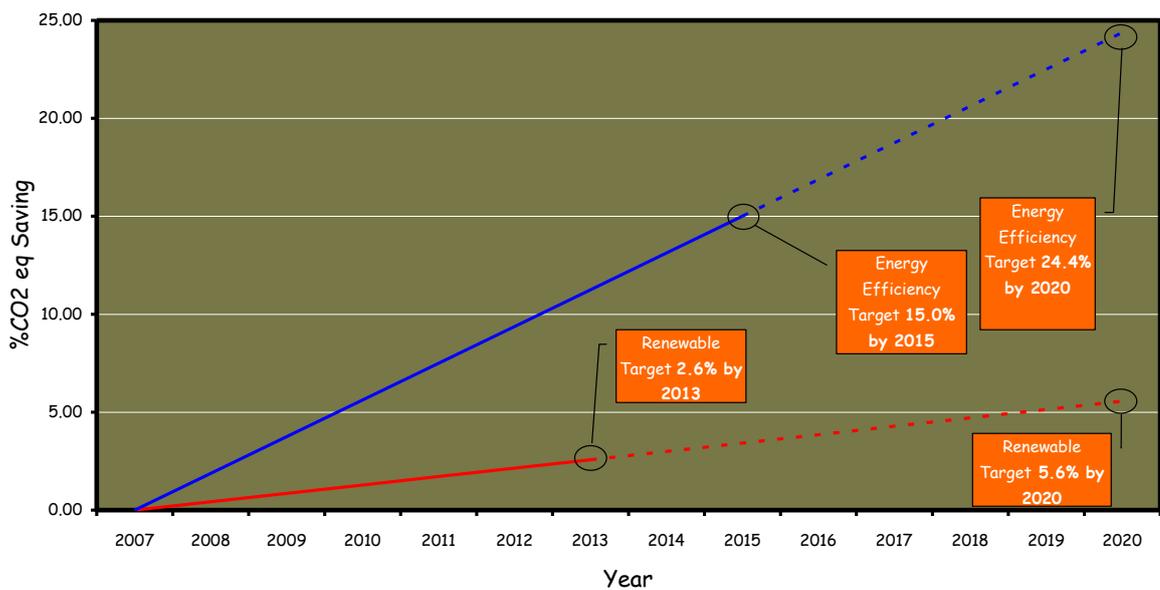
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THE TARGET

Assuming National RE and EE Targets are achieved, what would be the annual savings potential by 2020 if savings continue to be made at the same rate?

Figure 17 shows savings CO₂ savings projections for RE and EE given the existing National Targets. The trend lines show EE savings (in blue) reaching 15% by 2015 and RE savings (in red) reaching 2.6%¹⁴ by 2013. Both lines are extrapolated on a straight-line basis to show the savings effect by 2020.

Figure 17 EMA Industry, Commerce & Agribusiness Sector: National Energy Targets applied to EMA



A total savings potential of 30% would be achieved by 2020 if National RE and EE Targets are met and savings continue at the same rate.

¹⁴. This is the 'all-energy' percentage CO₂ saving attributable to RE for this theme, given a 4% offset against electricity usage only, as stipulated in the RE White Paper



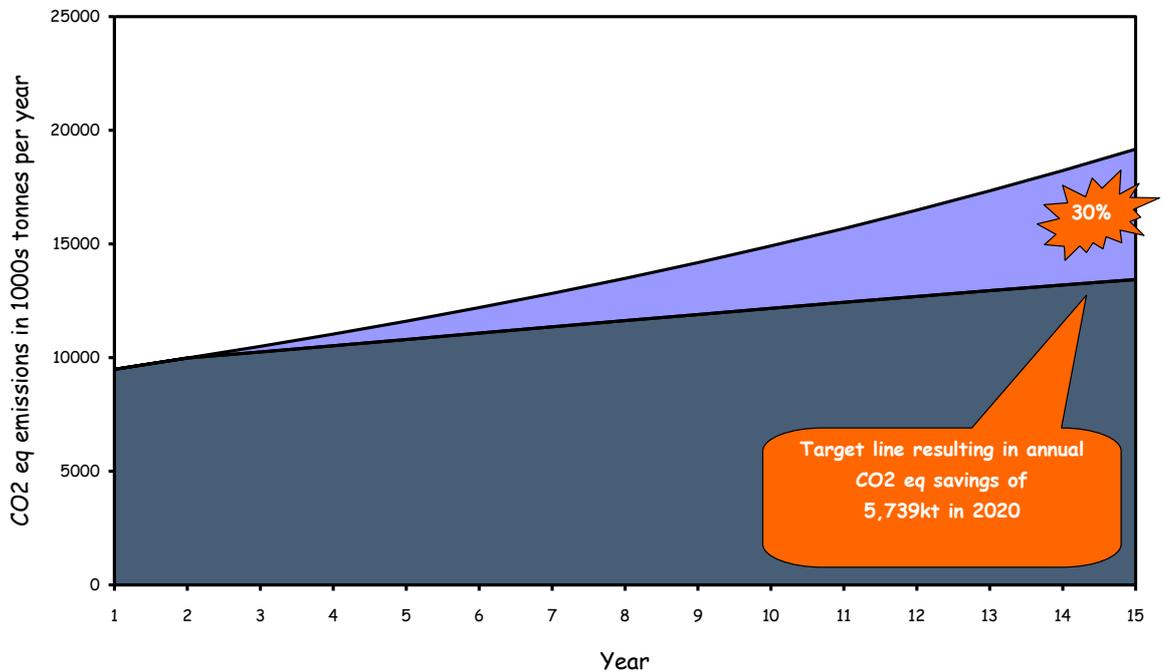
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THE OUTCOME

What effect would the target of 30% CO₂ savings for the Industry, Commerce & Agribusiness Sector have upon emissions by 2020?

Figure 18 shows the effect of the target on forecast BAU CO₂ emissions. The top line represents the BAU scenario as discussed previously, whilst the lower line is shows the forecast CO₂ emissions if the target is met.

Figure 18 EMA Industry, Commerce & Agribusiness Sector: Target CO₂ Emissions Reduction



An annual saving of 5,739kt CO₂ would be achieved by 2020 in the industrial, commercial & agribusiness sector if the savings target is achieved. The cumulative savings by 2020 would be over 33,200kt CO₂.



EThekweni Municipality Energy Strategy

9.4 Industry, Commerce & Agribusiness Sector Action Plans

Industry, Commerce & Agribusiness Sector Action Plan 1					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Undertake Development Planning to Maximise Efficiency</p> <p>This Action Plan intends to embrace the concept of Industrial Clusters, wherein industrial symbiosis and sharing of energy services could be more easily facilitated.</p> <p>Industrial & commercial development plans should encourage and support projects and measures which conserve energy, increase the use of renewable energy sources and support more sustainable point-of-use generation.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> • Appoint a Working Group for the provision of planning guidelines in EE and RE; • Draw-up draft guidelines regarding EE and RE considerations for new industrial and commercial developments; • Field test the draft guidelines for applicability and usefulness through an appropriate process; • Make the finalized guidelines mandatory within the development planning process. This may require the introduction of an Energy Efficiency by-law as discussed elsewhere within the Action Plans. 	<p>To contribute toward meeting Theme Objectives:</p> <p>C1, C2, C3, C4, C5 and C6</p>	<p>Consultative board: Short-term (<2 years)</p> <p>Guidelines: Medium-term (2-5 years)</p> <p>Roll-out: Long-term (>5 years)</p>	<ul style="list-style-type: none"> • EThekweni Municipality Energy Body; • EThekweni Municipality Development Planning Unit. 	<p>Energy savings cannot be quantified until draft guidelines have been formulated.</p>



EThekwini Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 2					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promotion of ESCOs and EEDSM</p> <p>This Action Plan intends to encourage the employment of Energy Service Companies (ESCOs), in particular within DSM projects and new-build industrial schemes where utility-sharing and/or sustainable co-generation may be viable.</p> <p>ESCOs are already playing a vital role in the Eskom DSM programme. There is potential to further develop the energy service provision market to encourage greater energy efficiency within this Theme.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Liaise with Industry and Eskom DSM to identify remaining barriers to engagement of ESCOs; • Assist in development of a local ESCO network as a branch of the National Association of ESCOs; • Assist in further promotion of DSM within local Industry and the introduction of ESCOs to potential clients. 	<p>To contribute toward meeting Theme Objectives: C3 and C5</p>	<p>Short to medium-term (up to 5 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Municipality Electricity Department; • ESKOM; • NERSA; • ESCOs. 	<p>Energy savings cannot be quantified until further project scope has been established.</p>



EThekweni Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 3					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promotion of Green Power</p> <p>This Action Plan intends to identify the potential market for Green Power, both now and into the future, and actively promote the concept to industry, commerce and agribusiness.</p> <p>Green Power refers to electricity generated via renewable & sustainable means, which can be traded (via TRECs or other wheeling mechanisms) such that users may meet prescribed Carbon commitments.</p> <p>The Green Power market within the EMA currently has no external driving forces, although this may change in 2012 whereupon National Carbon targets could come into force under the Kyoto Protocol.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Establish the current market value of Green Power within the sector. An evaluation of the existing market will enable an assessment to be made of the immediate additional demand for RE within the EMA; Estimate the potential market of Green Power based on possible future carbon reduction commitments for South Africa post-2012; Promote Green Power as a mechanism for industrial and commercial organizations to meet future Carbon reduction targets; Ensure ongoing liaison with DME regarding future development of TREC systems in SA; Consider mandating a compulsory percentage Green Energy purchase by largest electricity users; Consider a Climate Change Levy system applied to energy purchases. This would have the advantage of rapid roll-out potential locally, as opposed to a national tax directive or tariff change; Investigate viable options for commercial power producers to access the Grid; Continue ongoing discussions with Eskom regarding introduction of Green Tariffs during 2008. 	<p>To contribute toward meeting Theme Objectives: C1, C2, C3, C4, C5 and C6</p>	<p>Initial scan: Immediate Market development: Medium-term (2 - 5 years) Full potential: Long-term (>5 years)</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Electricity Department; EThekweni Municipality Legal Department; DME RE Directorate; EThekweni Municipality Communications Department; Industry, commerce & agribusiness; SABS; NERSA; Eskom. 	<p>Target all bulk users to purchase a minimum of 25% electricity supply from renewable sources.</p> <p>The forecast BAU electricity-related Carbon output of bulk users by 2020 is expected to be 9,800kt CO₂ equivalent per annum. Assuming the Strategy EE Actions Plans are successful, this would reduce to 7,840kt per annum.</p> <p>Total savings targeted will be 1,960kt CO₂ equivalent per annum</p>



EThekwini Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 4					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Introduction of Industrial EE Standards</p> <p>This Action Plan intends to pre-empt the introduction of National EE Standards for industry by introducing a programme of awareness within selected industrial groupings in the EMA.</p> <p>New National EE Standards are being developed by SABS which address specific industrial technologies. These are: EE standards for non-utility steam boilers, EE standards for AC electric induction motors and EE guidelines for steam pipe insulation specification and installation.</p> <p>These standards may become mandatory in due course, and eThekwini Municipality should be proactive in encouraging their early adoption to maximize the savings benefits at the earliest opportunity.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Assist with publicizing new standards in liaison with key industrial representatives; Approach the DME requesting expansion of AC motors standards to include re-winding. <p>Industry to:</p> <ul style="list-style-type: none"> Adopt EE standards and procedures within flagship industries. Possibly develop case study materials for further promotion; Roll-out adoption of EE standards in a timely manner. <p>EThekwini Municipality and key industrial stakeholders to:</p> <ul style="list-style-type: none"> Formalize liaison with National Government regarding promulgation and regulation of EE standards. 	<p>To contribute toward meeting Theme Objectives: C1, C2, C3, C5, C7 and C8</p>	<p>Short-term (<2 years)</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; SABS and DME; Industry groups and Industry associations; DCCI; NBI. 	<p>Assumes an overall 5% improvement in efficiency across 50% of industrial sites by 2020.</p> <p>Total savings targeted will be 412kt CO₂ equivalent per annum</p>



EThekwini Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 5					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Roll-out of an Industrial Energy Audit Programme</p> <p>This Action Plan intends to pre-empt the introduction of a National audit scheme by initiating a programme of subsidised energy audits within selected industry/commercial groupings in the EMA.</p> <p>The NEES identifies mandatory energy audits as an instrument to encourage energy efficiency within industry. It is envisaged that early EE benefits will be gained, followed by a move towards a mandatory audit scheme for all industry in the future.</p> <p>The provisional programme cited within the NEES will be expanded to include LCA as part of the auditing process. The LCA may be expanded to include transport-related impacts as deemed relevant and applicable to the audited site.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Develop a <i>Certified Energy Auditor</i> database, adopting existing training and certification materials developed through the DME; • Develop and agree on a standard audit format to ensure consistency and transparency in auditing and reporting practices; • Agree on audit qualification criteria for industry to enable the appropriate focus of resources, and to ensure that energy intensive industries are prioritized for mandatory audits in the short term; • Subsidize trial audits to demonstrate the concept of energy auditing as a means of identifying bankable efficiency projects; • Publicize the initial outcomes and results to ensure that industry & commerce is fully aware of the financial and environmental gains possible via an energy efficiency audit. 	<p>To contribute toward meeting Theme Objectives:</p> <p>C1, C2, C3, C4, C5, C6 and C7</p>	<p>Voluntary system in Medium-term (2-5 years)</p> <p>Mandatory system in Long-term (>5 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • Industry and industry associations; • NBI; • Energy Efficiency Auditors and Energy Management Specialists; • DME EE Directorate; • Energy Audit Training Providers, SAEE. 	<p>Savings included under Awareness Raising section of Action Plan 8</p>



EThekwini Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 6					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Introduction of Commercial Buildings Standards</p> <p>This Action Plan intends to pre-empt the introduction of National EE Standards for buildings by introducing a programme of awareness within selected commercial groupings in the EMA.</p> <p>The new National standard, SANS204 Energy Efficiency Buildings Design, is currently being finalized and will be promulgated in due course. Roll-out of this standard for all new commercial buildings will therefore become mandatory.</p> <p>EThekwini Municipality will be proactive in early adoption of the SANS204 requirements to ensure maximum benefit is derived at the earliest opportunity.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Liaise with SABS and DME regarding progress and process of new standard; • Ensure early adoption of standard's requirements in planning approval process; • Include mandatory Standards within an EE By-law; • Make additional requirements within a local by-law. These could include life-cycle assessments where embodied energy in building materials are accounted for as part of the sustainability assessment for new build commercial premises, etc; • Awareness raising programme required for contractors and other buildings professionals; • Consider the use of pilot studies to assist with awareness-raising. 	<p>To contribute toward meeting Theme Objectives: C2, C3, C5, C7 and C8</p>	<p>Short-term (<2 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • SABS; • DME; • EThekwini Municipality Development Planning & Management Unit; • Private sector (construction and architecture); • Commercial building sector. 	<p>The BAU 2020 forecast Carbon output for Business & General users is approximately 5,360kt CO₂ equivalent per annum, of which 25% is assumed to be derived from new build commercial buildings use.</p> <p>Savings achievable via buildings EE Standards may range from between 7% to 35%. If an average of 15% is assumed, Target savings would be 200kt CO₂ equivalent per annum.</p>



EThekwini Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 7					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Development of Energy Reporting Mechanisms</p> <p>This Action Plan intends to establish an energy reporting protocol for the largest 20 energy users within the Municipality, with the intention of expanding the reporting protocol to further industries in due course.</p> <p>Larger Industries should be encouraged to make their energy usage data available in the public domain. This not only promotes freedom of information, but also applies indirect pressure upon energy users to deliver an environmentally responsible image to the wider public, thereby encouraging efficient practices.</p> <p>As well as making energy usage data publicly available, the Action Plan will also Provide industry with an opportunity to publish energy efficiency improvements made, and highlight its sustainability objectives to the general public.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Identify the largest 20 energy users within the EMA; Establish a protocol for the provision and publication of yearly energy data (electricity and fossil fuels) against appropriate production variables; Refine mechanisms for energy data gathering throughout the sector; Develop a large industry league table in terms of efficiency improvements made. 	<p>To contribute toward meeting Theme Objectives: C7 and C9</p>	<p>Medium-term (2-5 years)</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; Industry as defined by energy usage data. 	<p>Energy savings included under Awareness Raising (Action Plan 8).</p>



EThekweni Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 8					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Capacity Building in EE and RE</p> <p>Awareness-raising</p> <p>This part of the Action Plan is intended to develop an effective promotional campaign wherein the EE and RE message will be disseminated throughout the industrial, commercial and agribusiness communities of the EMA;</p> <p>It should include the development, preparation and dissemination of information materials on EE and RE technologies and on Energy Management best practice, much of which is already in existence internationally. It will identify and catalogue these materials, as well as to provide a one-stop-shop for the sector in order to make access quick and convenient.</p> <p>Awareness-raising activities will also link with an associated Action Plan of Best Practice Awards for Energy Management.</p>	<p>EtheKwini Municipality to:</p> <ul style="list-style-type: none"> Undertake a research phase to identify sources of relevant information. These will include Best Practice documentation, BAT awareness documentation, case studies, studies carried out by DME, and additional information as it arises; Establish a clearing-house, or public knowledge-base, where industry and commerce can access the various sources of information and consultant contact information; Invite and vet bids from local organizations which are able to provide EE and RE advice to industry & commerce; Encourage major industries to undertake LCA analysis of their operations, in terms of Carbon Footprint. This would be compared to international best practice as a benchmarking study of potential savings; Develop specific awareness raising strategies for EE and RE technologies; Ensure that the knowledge-base receives regular additions, updates and maintenance as required. 	<p>To contribute toward meeting Theme Objectives: C3 and C7</p>	<p>Research: Short-term (<2 years) Set-up: Medium-term (2-5 years) Maintenance: Ongoing</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Electricity Department; EThekweni Municipality Communications Department; Energy efficiency service providers, consultants, etc; Industry groups and Industry associations. 	<p>Savings estimate is pooled for this Action Plan, together with the following closely-related Action Plans:</p> <ul style="list-style-type: none"> Sectoral promotion of Voluntary Commitments (Action Plan 9); Reporting Mechanisms (Action Plan 9) Energy Audits (Action Plan 5) <p>An overall improvement in efficiency of 10% as a result of these in total is considered an achievable target figure for the Sector as a whole.</p> <p>Total savings targeted will be 1,916kt CO₂ equivalent per annum</p>



EThekwini Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 8 (continued)

Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Capacity Building in EE and RE (continued)</p> <p>Best Practice Awards for Energy Management</p> <p>This intends to support the Awareness-raising elements of this Action Plan by conveying the importance of good Energy Management practices</p> <p>A certificated, voluntary Energy Management Best Practice programme within groupings for Industry, Commerce and Agribusiness should be launched and linked to an annual 'Energy Champions' award.</p> <p>The Action Plan's objectives should be sustained by stimulating the participation of wider industry in Energy Management initiatives.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Work with key sector stakeholders to promote the tenets of Energy Management Best Practice at a corporate level, and to convey the benefits of good Energy Management practices to industry throughout the EMA; • Use established training and guideline materials developed by DME to ensure that all training in Energy Management undertaken as part of the Action Plan is done so to consistent and high standards; • Develop an acceptable protocol for assessing the maturity of Energy Management within participating organizations; • Introduce a formal certification process for participating industries deemed to have met qualifying criteria; • Introduce a voluntary Energy Champions contest held annually to reward the organization deemed 'most improved' in Energy Management issues. 	<p>To contribute toward meeting Theme Objectives: C3, C4, and C7</p>	<p>Medium-term (2-5 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • Industry groups and industry associations; • NBI,; • DCCI; • DME. 	<p>See above</p>



EThekweni Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 9					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Expansion and Promotion of Voluntary Energy Efficiency Commitments</p> <p>This Action Plan is intended to expand the National Business Initiative (NBI) Energy Accord commitments to a broader, more ambitious business commitment programme aimed at industry locally.</p> <p>The NBI formalized its Energy Accords during 2005. This is a voluntary agreement between industry and National Government to meet the energy savings targets as they are laid out within the NEES. Presently there are over 30 signatories to the Accords nationwide, comprising mainly large industrial groups and multinationals.</p>	<p>EtheKwini Municipality to:</p> <ul style="list-style-type: none"> • Further develop its relationship with the NBI and the business community of the EMA via existing communication channels; • Promote NBI Accords to local industries via the DCCI and other appropriate channels of communication; • Ensure appropriate publicity for all new local signatories to the NBI Energy Accords; • Consider which NBI EE reporting protocols may be adopted and used within the eThekweni Municipality Energy Strategy monitoring plan. 	<p>To contribute toward meeting Theme Objectives: C1, C2, C4, C5, C7, C8 and C9</p>	<p>Short-term (<2 years)</p>	<ul style="list-style-type: none"> • EThekweni Municipality Energy Body; • NBI; • Industry & commerce, and Industry associations; • DME; • DCCI. 	<p>Savings included under Awareness Raising (Action Plan 8).</p>



EThekweni Municipality Energy Strategy

Industry, Commerce & Agribusiness Sector Action Plan 10					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promotion of Energy Efficiency Clubs in Industry & Commerce</p> <p>This Action Plan intends to further promote and develop the concept of Energy Efficiency via Zero Waste Clubs within the EMA. Whilst the emphasis will be upon energy savings, the concept of a <i>Zero Waste</i> approach will be adopted in order to maximize the overall environmental impact of the Clubs.</p> <p>The "Club" approach has already proven locally successful in promoting best environmental practice amongst industry and commerce. To date, such clubs have primarily dealt with Waste Minimization and have focused on a specific industrial sector. Good examples have included the Hammarisdale Waste Minimisation Club and the Durban Metal Finishers Waste Minimisation Club;</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Identify suitable industry groupings for recruitment of two pilot clubs; Approach and recruit industries into pilot clubs, with assistance from external service providers; Monitor the progress and results of the pilot clubs as pre-cursor to large-scale roll-out of the concept. <p>Pilot Clubs concept:</p> <ul style="list-style-type: none"> Pilot programme of 2 or 3 Clubs, expanding to wider roll-out in due course. Club membership will comprise around 10 industries, usually from the same geographical location; Members will meet once per month for ideas sharing, training and capacity building. Each industry to nominate a project champion and elect a small team to handle day-to-day club activities and specific projects identified. 	<p>To contribute toward meeting Theme Objectives: C1, C2, C3, C4, C5, C6 & C7</p>	<p>Pilot: Short-term (<2 years) Roll-out: Medium and long-term</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; Industrial SMEs; Industry associations; Consultants; Conservancies. 	<p>It is proposed that at least 50% of eThekwin's industrial community should be encouraged to participate in these or similar activities up to 2020. Energy savings of 15% would be a realistic target for such clubs overall.</p> <p>The BAU 2020 forecast Bulk users Carbon output is approximately 13,800kt CO₂ equivalent per annum. The same figure for Business & General users is approximately 5,360kt CO₂ equivalent per annum, of which 50% is assumed industrially derived.</p> <p>Targeted CO₂ equivalent savings for Bulk users overall would be 1,035kt and for Business & General users the savings would be 200kt</p> <p>Total savings targeted will be 1,235kt CO₂ equivalent per annum</p>



10 Theme D: Transportation

10.1 Sector Overview and Goal

Transport energy usage within the EMA is significant, at almost 69,000TJ per annum, and accounts for atmospheric emissions of over 4,689,000tonnes CO₂ per annum. The prevailing volume of road-based transport is also an important contributing factor to local emissions, and this fact is evident in data gathered by the eThekweni Air Quality Monitoring Network. The transport modes targeted for energy savings by this Strategy, therefore, comprise road-based transport modes only, including energy usage accountable to Municipality-owned fleet, as well as all road-based freight transport.

eThekweni Transport Authority is well aware of the constraints and pressures being placed upon the existing transport infrastructure by the ever-increasing demand for convenient public transport, and its Integrated Transport Plan attempts to provide some solutions to this difficult problem. Public transport, however, is deemed unsafe and under-utilised, and under present trends traffic volumes are expected to continue to rise in the foreseeable future. Commuters will continue to use road-based vehicles at the expense of more environmentally sound alternatives - *until* such a time that those alternatives become easier, cheaper and safer.

A consolidated and integrated approach must be adopted by local, provincial and national government in order that this situation may be addressed and, with targeted effort, reversed.

Goal:

To work towards the elimination of all atmospheric pollutants arising from transport energy use by maximising the application of sustainable, energy efficient and renewable energy technology in both the public and private sector. To promote non-motorised transport and disincentivise private motorised transport. Development of a clean, safe, accessible and affordable integrated public transport system for all is key to achieving this goal.



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10.2 Transport Sector Objectives

Environmental Objectives

D1 Atmospheric pollution reduced

Congestion is a major contributing factor to local atmospheric pollution and consideration must be given to strategies to address this

D2 Impact of climate change reduced

The ongoing development and uptake of cleaner fuels and renewable energy technologies by all income groups will reduce GHG emissions.

Economic Objectives

D3 Investor confidence improved

Direct and foreign investment is heavily influenced by perceptions of the City, and an effective and efficient transport system will feature high on the list of investor priorities.

D4 Economic health of the city improved

Lost person-hours and production downtime due to transport delays and difficulties are familiar to the economic community. Improving transport efficiency will cut overhead fuel costs and lead to improved productivity.

Social Objectives

D5 Improve the convenience and safety of the public transport system (including non-motorised modes)

This should be viewed as a high priority if the general public are to be encouraged to make maximum use of public transport. Options to include cycling and pedestrianisation, towards a quality living environment

Institutional Objectives

D6 Modal integration of all public transport services

It is given that the convenience of private road-based transport is attractive to most travellers, despite increasing incidences of congestion. In order to address this, improvements in the safety and comfort of public transport and reduced costs are key.

D7 Rail use expanded

Rail is amongst the most efficient and low impact means of transport available. Passenger rail use represents a hugely under-utilised asset for the Municipality. A targeted approach is urgently required, in order to appropriately address the decline in passenger numbers and the increase in road freight.

D8 Communication between institutions responsible for long-term planning of transport sub-sectors improved

The Governmental spheres responsible for road, rail and diversified modes of transport are frequently seen to operate in isolation from each other. It is clear that a consolidated, integrated and efficient transport solution will only be attainable when all transport sub-sectors operate in harmony, and this can only result from effective collaboration of the bodies governing them.

D9 Formalised energy data collection protocols and guidelines introduced

The high-level data currently available for transport energy use requires disaggregation into further sub-sectors in order to be used for energy monitoring and targeting. This will require the cooperation of external stakeholders and data providers. Also necessary will be the provision of sector activity data such as vehicle mileage covered and freight tonnage hauled, as well as further disaggregation of various modes of transport in terms of vehicle numbers and age.



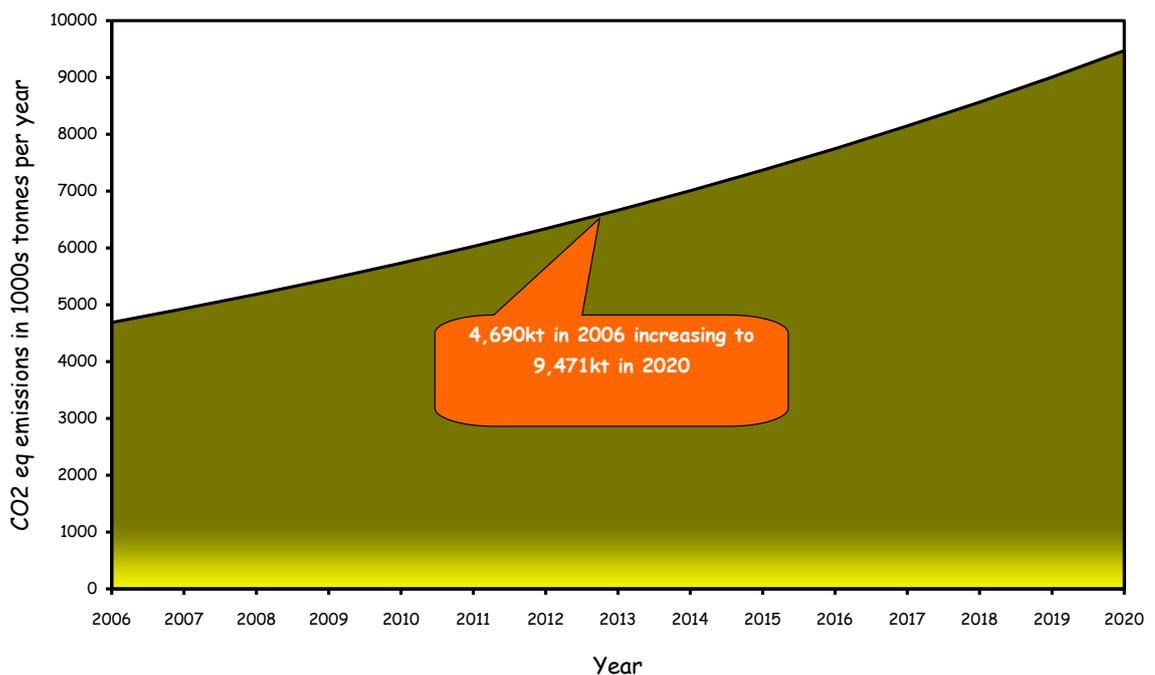
10.3 Transport Sector Target

BUSINESS AS USUAL

Assuming nothing is done, what will the annual Transport Sector CO₂ emissions become by 2020 in the EMA?

Figure 19 shows the forecast scenario for Transport-related CO₂ emissions over the coming 13 years, assuming a business-as-usual (BAU) scenario. The BAU assumptions are that energy growth will continue to increase at the current levels of economic growth (5.15%¹⁵ per annum) and that the existing energy mix will not alter significantly.

Figure 19 EMA Transport Sector: Forecast BAU Annual CO₂ Emissions



9,471kt per annum is the forecast CO₂ emission level for the Transport Sector by 2020.

¹⁵. EtheKwini Economic Development Unit communication 30th May 2007



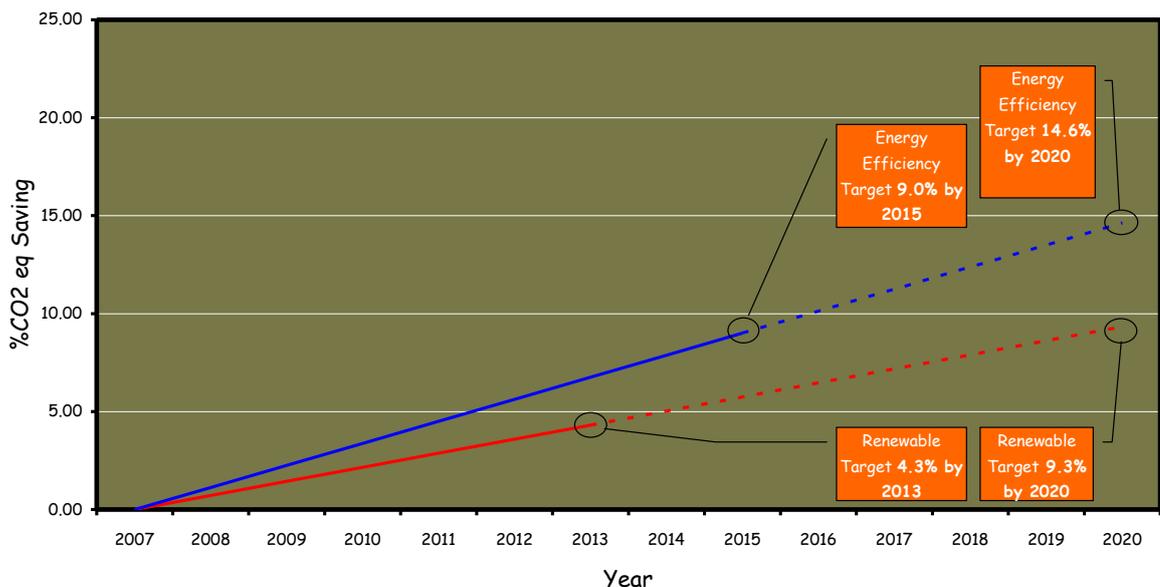
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THE TARGET

Assuming National RE and EE Targets are achieved, what would be the annual savings potential by 2020 if savings continue to be made at the same rate?

Figure 20 shows savings projections for RE and EE given the existing National Targets. The trend lines show EE savings (in blue) reaching 9% by 2015 and RE savings (in red) reaching 4.3%¹⁶ by 2013. Both lines are extrapolated on a straight-line basis to show the savings effect by 2020.

Figure 20 EMA Transport Sector: National Energy Targets Applied to EMA



A total savings potential of 24% would be achieved by 2020 if National RE and EE Targets are met and savings continue at the same rate.

¹⁶ This is the all-energy percentage CO₂ saving attributable to Biofuels for this theme: 4.5% offset against road transport petrol and diesel usage only, as stipulated in the draft Biofuels Strategy for South Africa.



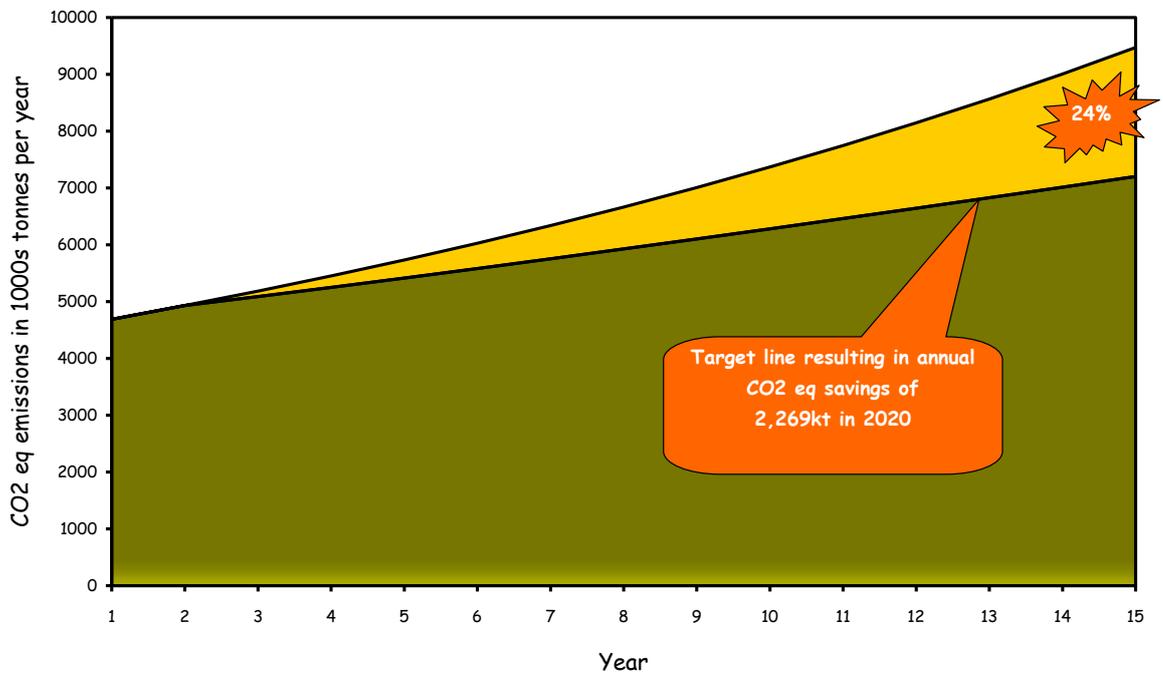
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THE OUTCOME

What effect would the target of 24% CO₂ savings for the Transport Sector have upon emissions by 2020?

Figure 21 shows the effect of the target on forecast BAU CO₂ emissions. The top line represents the BAU scenario as discussed above, whilst the lower line is shows the forecast CO₂ emissions if the target is met.

Figure 21 EMA Transport Sector: Target CO₂ Emissions Reduction



An annual saving of 2,269kt CO₂ would be achieved by 2020 in the Transport Sector if the savings target is achieved. The cumulative savings by 2020 would be almost 13,160kt CO₂.



EThekwini Municipality Energy Strategy

10.4 Transportation Sector Action Plans

Transportation Sector Action Plan 1					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Transport Planning</p> <p>General Considerations</p> <p>The 'general considerations' associated with this Action Plan are intended to expand EE considerations within eThekweni Municipality Integrated Transport Planning process. In particular, sustainable public transport and the negative impacts of transport on the physical environment.</p>	<p>eThekweni Municipality to:</p> <ul style="list-style-type: none"> Promote public transport over private transport through various measures including implementation of high occupancy vehicle (HOV) facilities; Investigate phasing of appropriate car restraint measures; Promote non-motorized transport including walking and cycling. This would partly be achieved by incorporation of pedestrian and cycle-friendly routes into the City planning process; Encourage the use of environmentally friendly vehicles and energy; Ensure new public precincts utilize metal halide lighting to enhance safety, security and usability of pedestrian thoroughfares; 	<p>To contribute toward meeting Theme Objectives: D5, D6 and D8</p>	<p>Ongoing</p>	<ul style="list-style-type: none"> eThekweni Municipality Energy Body; eThekweni Municipality Institutional Framework; eThekweni Municipality Transport Authority; eThekweni Municipality Development Planning Department; 	<p>Energy savings are not considered quantifiable without further research and development.</p>



EThekweni Municipality Energy Strategy

Transportation Sector Action Plan 1 (continued)					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Transport Planning (continued)</p> <p>Schools Transport Planning</p> <p>This Action Plan intends to encourage schools and parents to consider alternatives to private vehicle use for transport of learners to and from their place of education.</p> <p>With in excess of 1000 schools inside the EMA boundary, the contribution of school traffic to rush-hour congestion is significant, in particular within urban and peri-urban areas.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Establish a working group between national, provincial and local passenger transportation stakeholders (rail and bus) to improve co-ordination in planning for school transport solutions; Explore options to reduce school traffic during peak hours. Options to include lift-clubs and novel financing for school bus routes, etc; Undertake an awareness-raising programme amongst parents to draw attention to the financial costs associated with school transportation by private car. This will provide incentives to explore novel financing options for school buses, etc; Introduce local walk and cycle lanes in close proximity to schools as incentive to parents and learners. Schools should be encouraged to provide adequate cycle lock-up facilities. Consider the introduction of School Taxi services available to all learners. Safety regulation and driver training would be mandated to adhere to appropriate National Standards. 	<p>To contribute toward meeting Theme Objectives: D1, D2, D4, D5, D6, D7 and D8</p>	<p>Medium-term (2-5 years)</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Institutional Framework; National & Provincial Education Authorities; EThekweni Municipality Transport Authority. 	<p>Energy savings are not considered quantifiable without further research and development.</p>



EThekweni Municipality Energy Strategy

Transportation Sector Action Plan 1 (continued)					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Transport Planning (continued)</p> <p>Commuter Transport Planning</p> <p>This element of the Transport Planning Action Plan intends to discourage private-sector vehicle usage within the Durban CBD and reduce City-centre traffic volumes, thereby reducing peak traffic flow within the major commercial hubs of the EMA.</p> <p>An integral aspect of the Action Plan will be to encourage the uptake of non-motorized transport options for commuters where feasible. This will be of relevance to CBD commuters as well as the non-CBD commuter groups alike.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Establish a working group between national, provincial and local passenger transportation stakeholders (rail and bus) to improve co-ordination in planning for commuter transport solutions; Introduce park-and-ride facilities for special events within the city, as a pilot; Assess the practicalities of providing bicycle lock-up facilities in close proximity to bus-stops and bus-stations; Encourage private business, industry and commerce to develop more efficient transport options for employees, including lift-sharing, non-motorized transport, etc; Explore barriers and solutions to increase the uptake of public transport means. This will include addressing safety, accessibility and cost issues; Phase the introduction of preferential commuter/taxi lanes to all major commuter routes; Develop a City Bicycle Circular Rouse, utilizing existing networks of open space within the DMOSS areas; Consider disincentives for private vehicle use within the CDB. These could include the use of a city-centre toll system. 	<p>To contribute toward meeting Theme Objectives:</p> <p>D1, D2, D3, D4 and D6</p>	<p>Medium or long-term (2-5+ years)</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Transport Authority; Metrotrans; Industry and commerce; Bus and coach operators; Taxi associations. 	<p>A 15% reduction in general private vehicle and commuter traffic volumes should be targeted by 2020. This would result in a minimum of 25% reduction in forecast petrol usage at that time.</p> <p>Assuming a 10% intervention by bio-ethanol blending, the non-municipality petrol usage would be some 1,786 million litres per annum. A targeted 15% saving would result in a saving of 710kt of CO₂ equivalent per year.</p> <p>Total savings target will be 710kt CO₂ equivalent per annum</p>



EThekwini Municipality Energy Strategy

Transportation Sector Action Plan 2					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Awareness Raising</p> <p>This Action Plan intends to undertake a Municipality-wide awareness-raising campaign to all private vehicle users to promote the financial and environmental advantages of energy efficiency in transport.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Identify sources of relevant information, including Best Practice documentation, BAT awareness documentation and case studies; Develop specific awareness raising strategies for EE in transport; Liaise with the petrochemical industry to assist with the publication and dissemination of awareness materials, for example at petrol stations. 	<p>To contribute toward meeting Theme Objectives: D1 and D2</p>	<p>Short-term (<2 years)</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; EThekwini Municipality Transport Authority; EThekwini Municipality Communications Department; SAPIA; DME. 	<p>Savings are not considered separately quantifiable and are included in savings for Commuter Transport Planning (Action Plan 1).</p>



EThekweni Municipality Energy Strategy

Transportation Sector Action Plan 3					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promote uptake of Bio-diesel</p> <p>This Action Plan intends to stimulate a buoyant and self-sustaining market for bio-diesel within the EMA, and beyond, by elevating bio-diesel to be the <i>fuel of choice</i> for commuters, commercial operators and public transport alike.</p> <p>It will encourage the direct substitution of bio-diesel via accredited blenders and the maximized use of the existing transportation fuel distribution and retail system.</p> <p>The stimulation of a bio-diesel market will ensure long-term security of supply and availability to the commercial sector and wider public.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Encourage options for a sustainable, long-term source of bio-diesel to meet projected demand into the future; Facilitate the use of bio-diesel from sustainable sources as a bulk fuel purchaser. Displacement of 100% diesel usage in Municipal Fleet by bio-diesel; Consider the introduction of service contracts that stipulate the use of bio-diesel as a contractual obligation; Promote the use of bio-diesel vehicles in preference to petrol-fuelled vehicles where possible within the City Fleet; Actively promote bio-diesel replacements within the private vehicle sector, as well as for commercial road-based transportation modes; <p>Transportation sector stakeholders to:</p> <ul style="list-style-type: none"> Investigate the use of financial incentives for the supply and demand of bio-diesel as an alternative fuel source. This might include Carbon Finance as one possible option. 	<p>To contribute toward meeting Theme Objectives: D1 and D2</p>	<p>Medium term (2-5 years)</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Waste Water Department; Vehicle Manufacturers, NAAMSA EThekweni Municipality City Fleet Management Department; SAPIA; DME; SABS; Public Transport Operators; Commercial Freight Operators 	<p>At current growth rates, it is estimated that by 2020, EThekweni City Fleet would use 59.8 million litres of hydrocarbon diesel per annum. Assuming a 78% reduction in GHG emissions from substitution of bio-diesel at 100% substitution (no blend), this would result in carbon savings of as much as 126, 500 tonnes of CO₂ equivalent per year.</p> <p>Un-checked, the non-municipality diesel usage by 2020 would be 1,880 million litres of hydrocarbon diesel usage per annum. If 25% of this total were to be substituted by 100% bio-diesel, then annual savings of 994,000 tonnes of CO₂ equivalent per year would result.</p> <p>Total savings target will be 1,120kt CO₂ equivalent per annum.</p>



EThekwini Municipality Energy Strategy

Transportation Sector Action Plan 4					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promote uptake of Bio-ethanol</p> <p>This Action Plan intends to stimulate a buoyant and self-sustaining market for bio-ethanol within the EMA, and beyond, by promoting a 10% bio-ethanol blend as the <i>fuel substitution of choice</i> for all petrol-engine vehicle owners.</p> <p>It will make maximum use of the existing transportation petrol distribution and retail system and will ensure the long-term security of supply and availability to the commercial sector and wider public.</p>	<p>Ethekwini Municipality to:</p> <ul style="list-style-type: none"> Encourage bio-ethanol production by developing agreements to purchase ethanol (or ethanol blend) in bulk from the major oil companies; Convert municipal fleets to use the mandated 10% blend, involving no changes to the vehicle fleet, thereby providing a key market driver for ethanol use; Actively promote bio-ethanol blend replacement within the private vehicle sector, as well as for commercial road-based transportation modes; 	<p>To contribute toward meeting Theme Objectives: D1 and D2</p>	<p>Medium term (2-5 years)</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; Vehicle Manufacturers, NAAMSA EThekwini Municipality City Fleet Management Department; SAPIA; DME SABS 	<p>At current growth rates, it is estimated that by 2020, eThekwini City Fleet would use 12.9 million litres of hydrocarbon petrol per annum. Assuming a 90% reduction in GHG emissions from substitution of a 10% blend bio-ethanol, this would result in a carbon saving of 2,670 tonnes of CO₂ equivalent per year.</p> <p>Un-checked, the annual non-municipality petrol usage would be 1,984 million litres. Replacement with 10% bio-ethanol blend would result in Carbon savings of 411,000 tonnes of CO₂e per year.</p> <p>Total savings target will be 414kt CO₂ equivalent per annum</p>



EThekweni Municipality Energy Strategy

Transportation Sector Action Plan 5					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promote Rail-based Freight Transport</p> <p>This Action Plan intends to encourage commercial freight operators to consider rail as the transport mode-of-choice, thereby reducing the numbers of HGVs on the main transport corridors.</p> <p>Additionally, it should encourage industry to consider product transportation as integral to the LCA approach promoted via the Industry Action Plans.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Establish liaison with national, provincial and private sector freight transportation stakeholders to formulate a strategy to increase rail-based freight transport into and out of the EMA; Consider introducing a surcharge on all commercial road and freight transportation users by 2020. This could be implemented as a national incentive pending discussion with NDoT; Where relevant, include product transportation within LCA audits carried out as part of the Industry Action Plans. 	<p>To contribute toward meeting Theme Objectives: D1, D2, D3, D4, D7 and D8</p>	<p>Long-term (>5 years)</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Transport Authority; SPOORNET; National Freight Haulers Association; NDoT; DCCI. 	<p>Energy savings are not considered quantifiable.</p>



EThekwini Municipality Energy Strategy

Transportation Sector Action Plan 6					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Vehicle Emissions Testing</p> <p>This Action Plan intends to introduce vehicle inspection and emissions testing routines as means to reduce vehicle-derived pollutants.</p> <p>The concept is proposed to initially be voluntary, possibly with incentives, but is anticipated to become mandatory in the longer-term.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Seek active co-ordination with NDoT in development of this Action Plan; • Volunteer as a pilot for emissions testing within the City Fleet, in particular with relevance to the SDB and the Air Quality Act: 2004; • Undertake investigation and research to establish basis of proposed vehicles emissions standards for South Africa; • Establish basis for SETA training and certification of accredited testing centres. Liaise with training providers and technical professionals to develop suitable training programme; • Establish the basis for a voluntary initiative, including financial incentives such as vehicle license rebates for qualifying participants. Develop into mandatory scheme in due course. 	<p>To contribute toward meeting Theme Objectives:</p> <p>D1</p>	<p>Long-term (>5 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Municipality City Fleet Management Department; • NDoT; • DME; • NAAMSA; • SARS; • Training Providers, SETA. 	<p>An improvement in 5% diesel vehicle efficiency should be achievable by 2020 as this action plan becomes mandatory for commercial vehicles. Projected hydrocarbon diesel usage in 2020 is 1,410 million litres, with a resulting saving of 187kt of CO₂ equivalent per year.</p> <p>Total savings target will be 187kt CO₂ equivalent per annum</p>



11 Cross-cutting and Institutional Issues

11.1 Introduction

This section covers institutional matters and other cross-cutting issues which are deemed relevant to more than one theme, or sector.

11.2 eThekweni EMD role in developing the Municipal Energy Strategy

The key mandate of the EMD is the planning and the management of the eThekweni Municipal Area's biodiversity through the Municipality's eThekweni Environmental Services Management Plan. Climate change, through changes in temperature, extreme weather events and rainfall (amongst other impacts) results in negative impacts on biodiversity. Fossil fuel based energy is the key driver of climate change. By addressing energy supply and demand issues at the municipal level, this impact can be reduced.

The EMD has been responsible for coordination and preparation of the eThekweni Energy Strategy as a result of the department's mandate and commitment to climate change mitigation. The implementation of the energy strategy falls outside of this mandate of EMD.

In order to support the roll-out of the energy strategy core functions and responsibilities an implementation framework is needed to ensure that the objectives, targets and action plans set out in the energy strategy are achieved.

In order for eThekweni Municipality to implement its Energy Strategy it is imperative that the Municipality consider the institutions core functions, capacity and mandate as well as the current governance arrangements that exist, in order to develop Management and Governance options for the implementation of the Strategy. A detailed review of a Potential Institutional Framework for an Energy Unit within the eThekweni Municipality will be undertaken and is included in the Institutional Action Plans.



EThekweni Municipality Energy Strategy

11.3 Cross-cutting & Institutional Action Plans

Cross-cutting & Institutional Action Plan 1					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Institutional Capacity Building</p> <p>This Action Plan is intended to establish an <i>Energy Body</i> mandated with ongoing management and further development of the Energy Strategy.</p> <p>In order to support the roll-out of the energy strategy core functions and responsibilities an implementation framework is needed to ensure that the objectives, targets and action plans set out in the energy strategy are achieved.</p>	<p>EtheKweni Municipality to:</p> <ul style="list-style-type: none"> Establish core working group comprising key Municipality Departmental representation, together with appointed external specialist to advise working group on options for establishing the Energy Body; Options for establishment of an Energy Body would be: <ol style="list-style-type: none"> External Agency Internal Group High-level Strategic Coordination Selection of the Agency (external service delivery mechanism) or Core Group (internal service delivery mechanism) models would be subject to the Municipal Systems Act, Section 78 process (review of internal and external service delivery mechanisms); 	<p>To contribute toward meeting Theme Objectives:</p> <p>ALL</p>	<p>High Priority: Immediately.</p>	<ul style="list-style-type: none"> EThekweni Municipality EMD; EThekweni Municipality HODs; External institutional advisers. 	<p>Not applicable</p>



EThekwini Municipality Energy Strategy

Cross-cutting & Institutional Action Plan 2					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Technical Capacity Building</p> <p>This Action Plan intends to build and strengthen eThekwini Municipality's own technical expertise to enable a high standard of support to the proposed Energy Body and its activities;</p> <p>The Municipality shall seek to recruit a high-level multidisciplinary team to assist with technical evaluation of energy projects, novel finance options, project management, CDM application, etc.</p>	<p>Ethekwini Municipality to:</p> <ul style="list-style-type: none"> Motivate for an internal technical team to assist the Energy Body in further development and roll-out of the Energy Strategy; Establish the necessary team composition and the core competencies of the required team members; Undertake a recruitment programme to secure necessary technical team members. This will involve advertisement, short-list, interview and appointment. 	<p>To contribute toward meeting Theme Objectives:</p> <p>ALL</p>	<p>High Priority: Immediately.</p>	<ul style="list-style-type: none"> EThekwini Municipality EMD; EThekwini Municipality HODs; External institutional advisers. 	<p>Not applicable</p>



EThekwini Municipality Energy Strategy

Cross-cutting & Institutional Action Plan 3					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Air Quality Management</p> <p>This Action Plan intends to provide ongoing support for implementation of the Air Quality Act, via the Air Quality Management Plan.</p> <p>The Durban AQMP is providing good information on Air Quality, health effects, cleaner production and licensing. This information can be taken to a higher level and used as input for good policymaking. By undertaking a cost/effectiveness study of different options for pollution abatement strategies industry is empowered to meet goals and targets already set by the AQMP.</p> <p>Air Quality issues will also impact traffic planning and will influence planning decisions in terms of where to construct new buildings.</p>	<p>EThekwini Municipality Energy Body to:</p> <ul style="list-style-type: none"> • Assist with Air quality guidelines, standards and limits; • Provide input to development of local goals for Air Quality; • Assist with the prioritization of abatement strategies for obtaining goals and cost-effectiveness; • Assist eThekwini Municipality Health Department in transferring specific AQMP plans into actions. 	<p>To contribute toward meeting Theme Objectives: B1, B2, B6 and B7</p>	<p>Ongoing</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Municipality Health Department; • Provincial DAEA; • National DEAT. 	<p>Energy Savings cannot be quantified</p>



EThekweni Municipality Energy Strategy

Cross-cutting & Institutional Action Plan 4					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Promote Green Power Tariffs</p> <p>This Action Plan intends to identify the potential market for Green Power, both now and into the future, and actively promote the concept to the all sectors within EMA.</p> <p>Consideration will be given to the use of full-cost accounting in order to promote the benefits of Green Energy sources.</p> <p>Green Power refers to electricity generated via renewable & sustainable means, which can be traded (via TREC or other wheeling mechanisms) such that users may meet prescribed Carbon commitments, etc.</p> <p>The Green Power market within EMA currently has no external driving forces, although this may change in 2012 whereupon National Carbon targets could come into force under the Kyoto Protocol.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Establish the current market value of Green Power within all sectors. An evaluation of the existing market will enable an assessment to be made of the immediate additional demand for RE within the EMA; Estimate the potential market of Green Power based on possible future carbon reduction commitments for South Africa post-2012; Promote Green Power as a mechanism for the Industrial, Commercial and Residential sectors to meet future Carbon reduction targets; Close ongoing liaison with DME regarding future development of TREC systems in SA; Continue ongoing discussions with Eskom regarding the introduction of Green Tariffs during 2008. 	<p>To contribute toward meeting Theme Objectives:</p> <p>A1, A2, A4, A5, A9, B1, B2, B7, C1, C2 and C3</p>	<p>Sort term (<2 years)</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Electricity Department; All end-users of electricity; Eskom, NERSA 	<p>Energy Savings to be quantified per sector, pending research into Sectoral market values for Green Power.</p>



EThekwini Municipality Energy Strategy

Cross-cutting & Institutional Action Plan 5					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Green Procurement Policy</p> <p>The Action Plan intends to take the <i>Green Procurement</i> principle forwards into industry and commerce, who will be encouraged to adopt the mechanisms demonstrated such that they too can gain benefit.</p> <p>Opportunities to upgrade energy conversion equipment for more efficient alternatives, or the use of renewable energy options, are often eliminated on the basis of unfavourable payback criteria using raw energy costs only.</p> <p>The Municipality will seek to redress this internally by adoption of novel financial considerations which include lifetime costs and environmental costs within the financial appraisal process. This Action Plan will, therefore, develop a formal policy and mechanism for consideration of external costs when establishing energy supply alternatives for the Municipality's own operations.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> Investigate and appraise existing environmental costing criteria; Adopt appropriate costing of externalities as standard operating practice for utility equipment procurement and for assessment of energy alternatives; Formulate novel tendering processes wherein equipment lifetime costs, including energy usage, are used as financial basis for tenders; Encourage business and commerce to adopt triple-bottom-line accounting procedures; Derive internal case studies for dissemination to private sector. <p>Large business and industry to:</p> <ul style="list-style-type: none"> Undertake Carbon Footprint evaluations themselves, based upon accepted Life Cycle analysis methodologies; Report upon LCA Carbon Footprint to the Municipality. 	<p>To contribute toward meeting Theme Objectives: B5, B6 and B7</p>	<p>Medium term (2-5 years)</p>	<ul style="list-style-type: none"> EThekwini Municipality Energy Body; Major Commerce and Industry players; Life Cycle Analysis service providers; UKZN. 	<p>Energy savings cannot be quantified</p>



EThekweni Municipality Energy Strategy

Cross-cutting & Institutional Action Plan 6					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>External Capacity Building, Training & Certification</p> <p>This Action Plan intends to ensure that sufficient RE and EE technical skills and knowledge are readily available for all stakeholders and participants in this Strategy.</p> <p>Firstly, It should provide homeowners and buildings developers the opportunity to employ utility service providers who have undertaken certificated EE and RE training. Secondly, it should facilitate the effective completion of energy audits and surveys within Municipal buildings, commercial buildings and industry by ensuring energy auditors have received the appropriate level of training required. Finally, it should ensure that suitably qualified and accredited testing centres are readily available for roll-out of the Vehicle Emissions Testing Action Plan.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Identify the trainee stakeholder groups across all sectors and collaborate with training providers to establish relevant training materials; Introduce a formal SETA certification process for participants deemed to have met qualifying criteria as relevant. Courses given through universities would be automatically approved and a training course could be designed at UKZN (with input from the Municipality) to start training municipal employees as an pilot for the programme; Development of a certified EE utility service provider database, which can be publicized and made available to the general public; Training would be required for relevant municipal workers and for contractors who receive municipal tenders (this would be written in into standard Municipality tender invitation documentation). 	<p>To contribute toward meeting Theme Objectives:</p> <p>ALL</p>	<p>High Priority: Immediately.</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Economic Development Unit; Sectoral Stakeholders; Training Providers; DME; SABS; SETA. 	<p>Not applicable</p>



EThekwini Municipality Energy Strategy

Cross-cutting & Institutional Action Plan 7					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Communications Strategy</p> <p>This Action Plan intends to reinforce contacts with National Government and other external stakeholders within a formalized communication framework. It will be of particular relevance to the success of Transport Sector Action Plans, as several spheres of government are involved in the planning and maintenance of public transport systems.</p> <p>Also of relevance will be the ongoing liaison with CEF and the EEDSM programme, as well as other national initiatives within EE and RE.</p> <p>The DME is considered a key stakeholder and the eThekwini Municipality Energy will maintain close contact to ensure early notice and action regarding targets, standards and national legislation concerned with EE and RE.</p>	<p>EThekwini Municipality to:</p> <ul style="list-style-type: none"> • Appoint a <i>Political Energy Champion</i> whose responsibility it will be to act as Municipality head representative with National and Provisional Government organizations; • Establish list of stakeholder communications groups at local, Provincial and National levels. Confirm contact details for communications groups' representatives, and proxy representatives; • Request formal meeting protocol with communications groups and establish contact with other municipalities with similar requirements, to encourage cross-sharing of ideas and skills; • Promote EE and RE information across all sectors. Disseminate EE and RE Best Practice information to the Industry, Commercial and Agribusiness sectors. Raise awareness in schools to highlight alternative transportation options. Undertake Flagship projects to use as high-profile promotional material for EE and RE; • Develop and publicize traffic tips throughout the EMA roads network. This may include the use of the new electronic information boards provided by the Ethekwini Municipality Transport Agency. 	<p>To contribute toward meeting Theme Objectives: C8 and D8</p>	<p>Short-term (<2 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Municipality Communications Department; • EThekwini Municipality Economic Development Unit; • Provincial Government (Health, Education, DAEA); • National Government (DME, DEAT); • Industry associations, NBI, DCCI; • Organisations represented by the EAC; • CEF; • Eskom; • NERSA 	<p>Not applicable</p>



EThekwini Municipality Energy Strategy

Cross-cutting & Institutional Action Plan 8					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Novel Finance Opportunities</p> <p>This Action Plan is intended to assist in developing novel finance initiatives (as well as other instruments) thereby encouraging the uptake of renewable energy technologies, as well as continue the use of alternative funding options to further renewable energy uptake.</p> <p>Options would include direct investment opportunities, as well as mechanisms to nurture RE projects by preferential tariffs, etc.</p> <p>Methods of raising revenue for reinvestment should be addressed, and could include local levies, or "Green Taxes".</p>	<p>EThekwini Municipality to Investigate and prioritize various funding options including the following:</p> <ul style="list-style-type: none"> • Clean Development Mechanism (CDM); • Increased exposure to existing funds, such as EEDSM National fund; • International Donors (European Commission, SEED, Danida, USAID, World Bank, UNEP, etc); • Buy-back tariffs for RE and Wheeling; • Loans, Grants, Export Credits and Mixed Credits as financial support mechanisms for RE service providers; • Environmental Taxes; • Subsidies; • The use of ESCOs, either via EEDSM or otherwise. 	<p>To contribute toward meeting Theme Objectives: B3 and B4</p>	<p>Short term (<2 years)</p>	<ul style="list-style-type: none"> • EThekwini Municipality Energy Body; • EThekwini Municipality Technical Support Services Team. 	<p>Energy savings cannot be quantified</p>



EThekweni Municipality Energy Strategy

Cross-cutting & Institutional Action Plan 9					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Sustainable Job Creation</p> <p>This Action Plan intends to ensure that optimal job opportunities are realised through the further development of the EE and RE sectors within the EMA.</p> <p>Job opportunities would arise as either a direct result of uptake of EE and RE technology (direct jobs), or as a spin-off from an improved environmental and economic profile of the city (indirect jobs).</p> <p>This also extends to the entire product supply chain wherein energy efficiency production, design and choice of materials will yield significant employment benefits.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Establish the potential for direct and indirect job creation within EMA, via the enhanced uptake of EE and RE technologies in-line with the Energy Strategy targets; Liaise with industry groups and industry associations to establish specific strategies for attracting EE and RE businesses into the EMA; Promote the EMA as a Centre of Excellence for EE and RE technology development and publicize this via media events and exhibitions; Encourage job creation within the recycling sector; Develop other promotional strategies, such as university sponsorships for energy technology graduates. 	<p>To contribute toward meeting Theme Objectives: B4 and C5</p>	<p>Ongoing</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; EThekweni Municipality Economic Development Unit; EThekweni Municipality Department of Solid Waste; Industry Organisations, DCCI, NBI. 	<p>Energy savings cannot be quantified</p>



EThekweni Municipality Energy Strategy

Cross-cutting & Institutional Action Plan 10					
Measure or Intervention	Actions	Objectives	Timeframe	Lead Agency and Key Stakeholders	Contribution to Theme Target
What	How	Why	When	Who	Savings
<p>Strategy Monitoring Plan</p> <p>This Action Plan intends to compile results-oriented information on Sectoral targets, projects and programmes, and will report progress in an objective, timely and "user-friendly" way to the key stakeholders of the Energy Strategy.</p> <p>Monitoring activity is defined as a continuing function that aims primarily to provide the management and main stakeholders of an ongoing intervention with early indications of progress, or lack thereof, in the achievement of results.</p> <p>A significant proportion of the energy usage data is already captured via the eThekweni Greenhouse Gas Emissions Inventory, which is undergoing further refinements during 2007, and this shall form the basis of the data capture methodology.</p> <p>Targets allow for variance in activity, and it is important to account for such activity by using either physical or monetary units of activity for each sector or theme. The choice between using physical versus monetary units for quantifying levels of activity can be made according to data availability, with preference being given to physical units. However, even when physical units are used, the level of activity quantified in monetary units must still be known.</p>	<p>EThekweni Municipality to:</p> <ul style="list-style-type: none"> Propose and develop an energy data capture mechanism for the Monitoring Plan; Propose and develop a data capture mechanism for sector activity, or output; Carry out monitoring as frequently as necessary to enable stakeholders to assess progress against targets and to realign strategic direction, if necessary. It is considered neither feasible nor practical to undertake monitoring annually, but rather to carry out a detailed monitoring exercise every 3-4 years using an existing framework where possible; Ensure formal relationships are developed and maintained between monitoring service providers and all energy and activity data providers. This may include the provision of standing instructions for data submission from certain role-players, linking this Action Plan with the Industrial Sector Action Plan for Development of Energy Reporting Mechanisms; Ensure that all outputs from the Monitoring Plan, such as target results and efficiency drivers, are made available to the wider public. A forum for discussion of monitoring outputs shall be provided for all stakeholders. 	<p>To contribute toward meeting Theme Objectives: A10, B10, C9 and D9</p>	<p>Establish during short-term (<2 years)</p> <p>Regular monitoring undertaken on an ongoing basis.</p>	<ul style="list-style-type: none"> EThekweni Municipality Energy Body; External monitoring service providers; All sector role-players and data providers. 	<p>Not applicable</p>



EThekweni Municipality Energy Strategy

Notes: