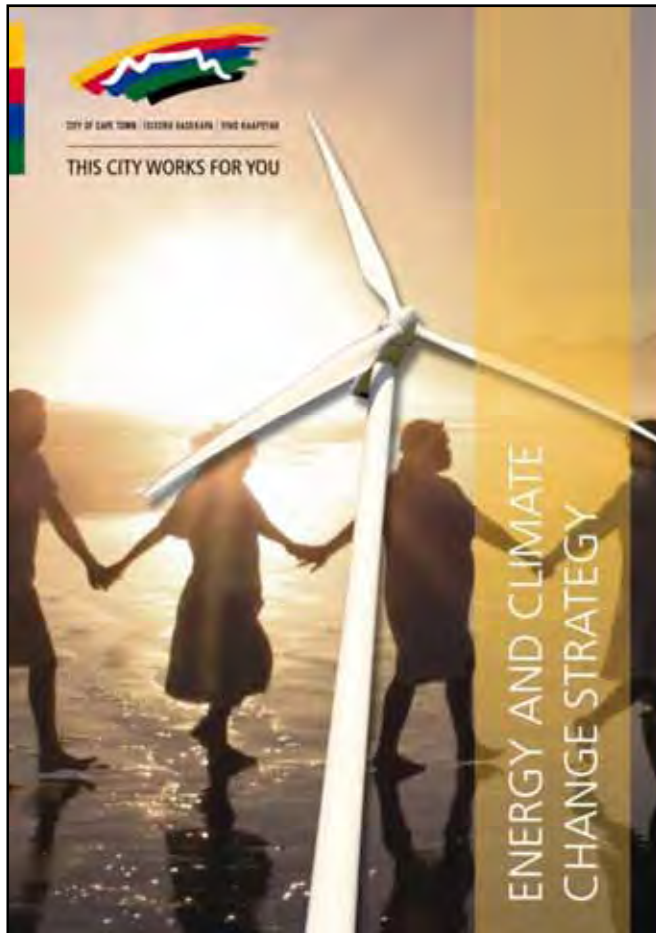




CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD



The City of Cape Town's Energy and Climate Change Strategy

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Environmental Resource Management Dept
City of Cape Town

UEMP Conference May 2009

Contents

- Where does Energy & Climate Change fit?
- Energy and Climate Change Strategy
- E&CC institutional arrangements in the City.
- Focus areas
- Projects and activities
- Research
- Challenges



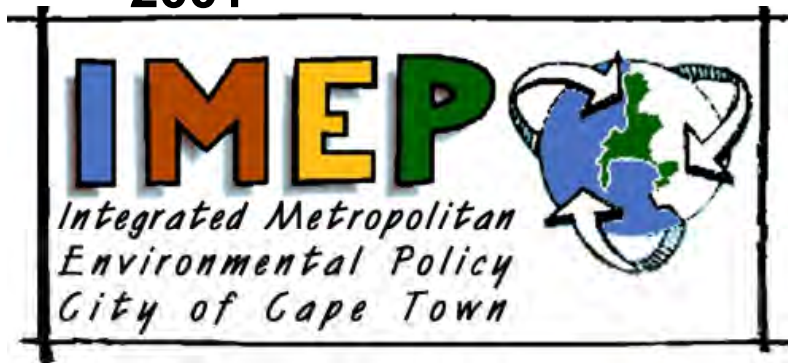
City of Cape Town: Energy & Climate Change

IDP

Strategic Focus Area 3
Energy for a Sustainable City
2008

2003 draft...2006 final

2001



State of Energy Reports

1. 2003
2. 2007



The Strategy sets out specific targets to achieve this vision derived from modeling.

It also identifies projects to achieve these targets.

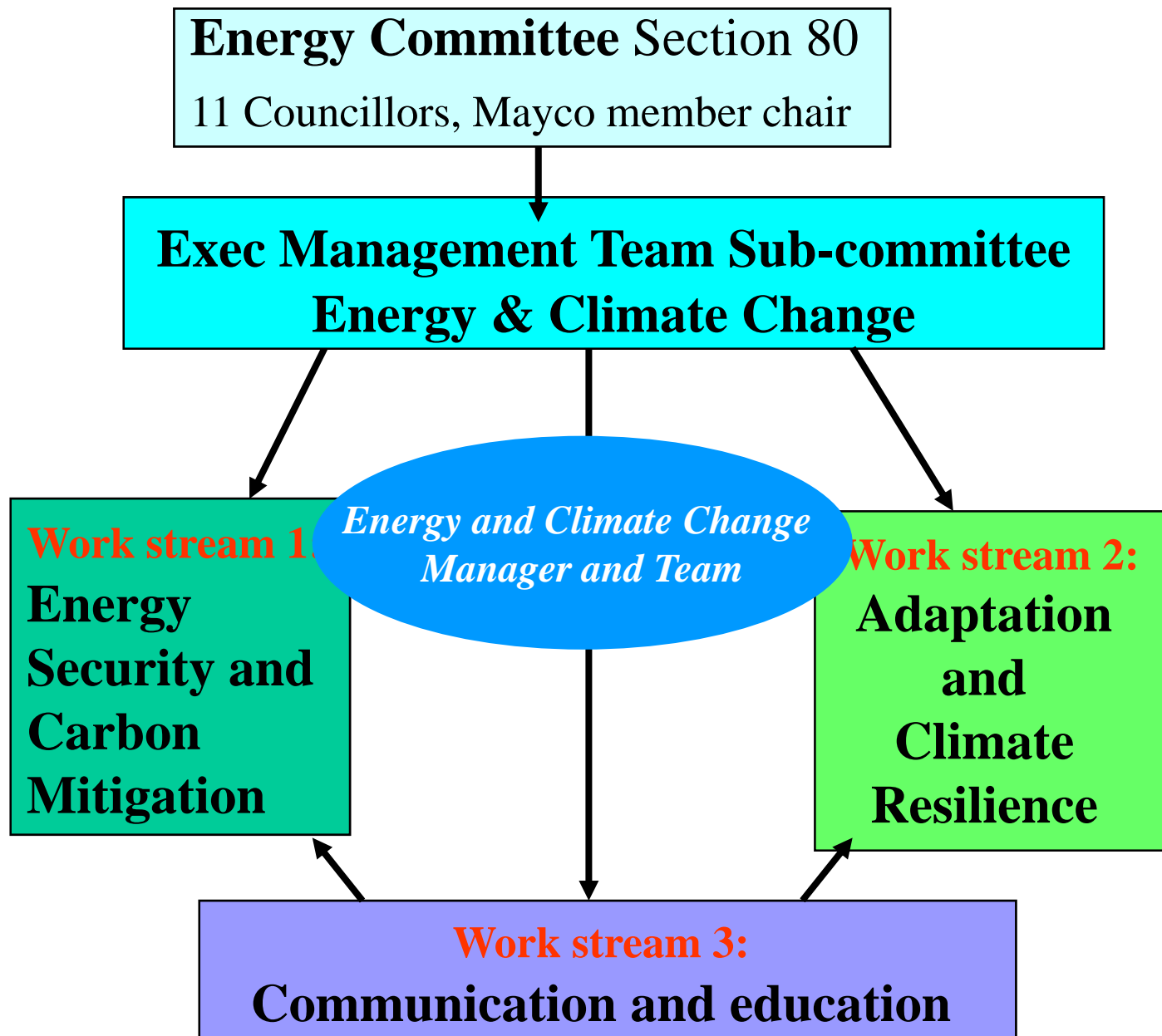
Institutional changes: From mid of 2008

- **Integrated Development Plan (IDP)**

Strategic Focus Area 3: Energy for a Sustainable City

- **Political leadership: Energy Committee (Section 80 advises Mayor and Mayoral Committee)**
- **Corporate leadership: Executive Management Team on Energy&Climate Change**
- **Integration into City departments: Cross-council work streams headed by Executive Directors**

Institutional developments to address Energy & Climate Change



Institutional Structure and Work Streams

Section 80 Committee
Chair: Mayco Member

Committee Secretariat

EMT Energy & Climate Change

Chair - ED: Strategy and Planning
 ED: Service Delivery Integration
 ED: Transport, Roads and Storm water
 ED: Finance
 ED: Utility Services
 ED: Housing
 ED: Health
 Legal Services
 Selected City officials and representatives

Oversee Compilation of reports to Section 80 Committee
 Drive integration and delivery on all energy matters according to the work streams below

City Health
 Air quality

Energy & Climate Change Manager

Liaison between work streams and EMT sub-committee.
 Management of the three work streams

Work Stream 1: Energy Security and Carbon Mitigation

Chair: ED Utilities ; D: Budgets

Members :

Electricity
 Economic Development
 Strategy and Planning
 Planning and Building Dev Management
 Spatial Planning and Urban Design
 Property Management
 Corporate Services
 Transport
 Service Delivery Integration
 Other depts. in Utility Services

Work Stream 2: Adaptation and Climate Resilience

Chair: Dir: Environmental Resource Management

Members:

Service Delivery Integration
 Environmental Resource Management
 Disaster Management
 Spatial Planning and Urban Design
 Utility Services (all depts.)
 Strategic Development Information, GIS
 Housing
 Transport, Roads and Storm water

Work Stream 3: Communications and Education

Chair: Director: Corporate Communications

Members:

Environmental Resource Management
 Electricity
 Other departments as required

City of Cape Town Energy & Climate Change Mission

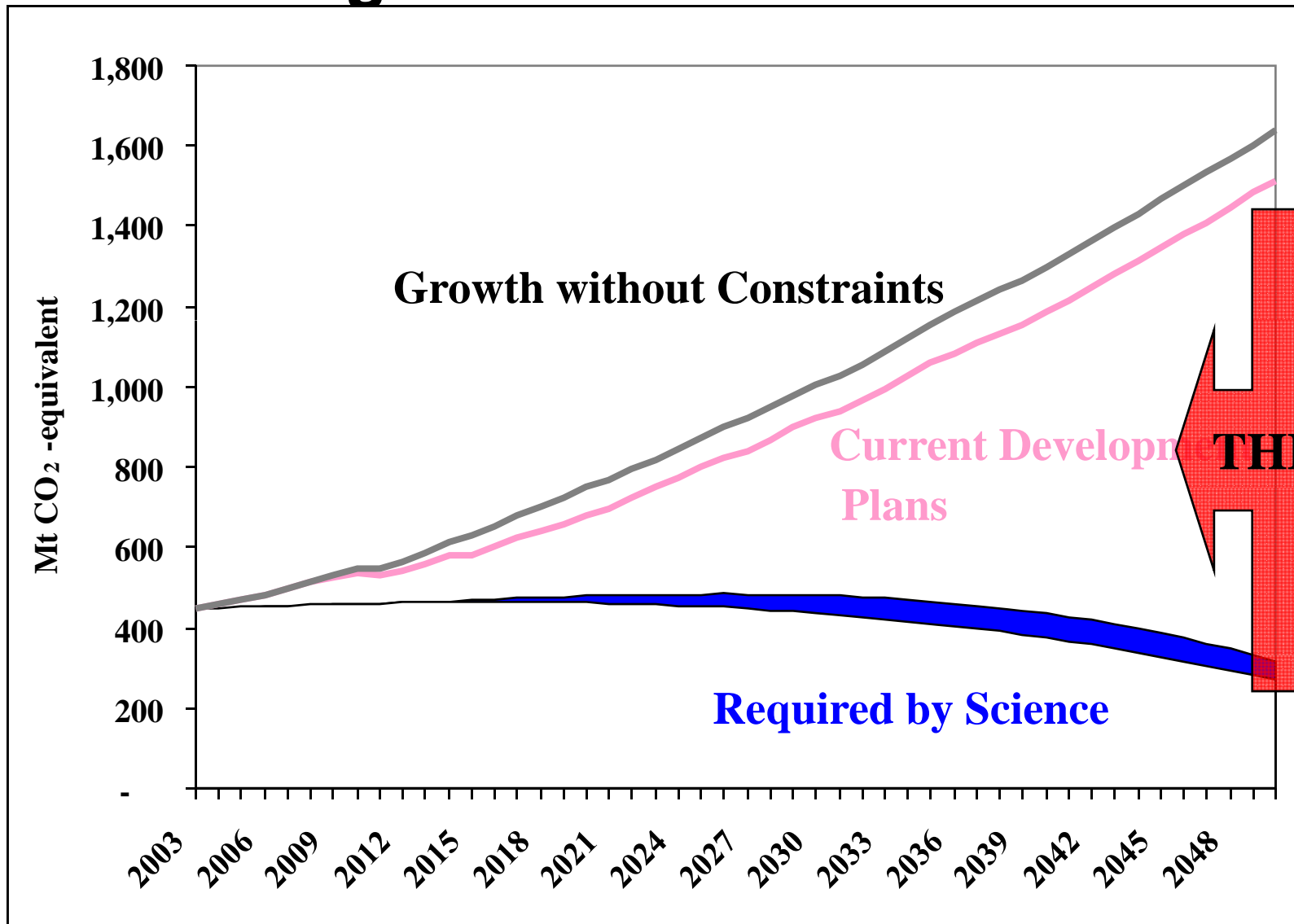
Energy security	<ul style="list-style-type: none">➤ Diversify and localise energy supply sources and ownership➤ Focus on energy efficiency
Low carbon growth path	<ul style="list-style-type: none">➤ Implement energy efficiency and renewable / cleaner energy sources➤ Economic competitiveness➤ Public transport
Poverty alleviation	<ul style="list-style-type: none">➤ Access to energy services➤ Sustainable livelihoods➤ Health and safety➤ Access to urban goods – public transport, location, densification
Impacts of climate change	<ul style="list-style-type: none">➤ Risk and adaptation,➤ Building climate resilience of vulnerable communities and ecosystems

E&CC Strategy: Summary of key energy targets per sector

DERIVED FROM LEAP MODELING (Cape Town Energy Futures Report)

Residential	<ul style="list-style-type: none">➤ 10% households to have Solar Water Heaters by 2010, 50% by 2020➤ All new subsidy housing to have ceilings; all existing homes to be fitted with ceilings by 2020
Transport	<p>By 2010 (from 2005 levels)</p> <ul style="list-style-type: none">➤ 10% increase in rail transport share of modal split➤ 10% decrease in private vehicles commuting into city centre➤ Non-motorised transport strategy operational by 2015
Government	<ul style="list-style-type: none">➤ 12% energy efficiency in all municipal buildings by 2015
Commerce and Industry	<ul style="list-style-type: none">➤ 10% increased energy efficiency in industrial and commercial facilities by 2010
Energy Supply	<ul style="list-style-type: none">➤ 100% of formal households connected to electricity from 2005➤ 90% of informal households connected to electricity by 2010➤ CO₂ emissions reduced by 10% from 2005 levels by 2010➤ 10% Renewable Energy Supply by 2020

Long Term Mitigation Scenarios – National government commitment



THE GAP

Western Cape Energy Targets - 2008

ACTION	TARGET	DATE
1. Renewable Energy generation (electricity only) in the Western Cape off the current consumption baseline of 4200MW	15% 1172MW of new RE needed by 2014	by 2014
2. Renewable Energy purchased by Provincial Government	10%	by 2010
3. Energy Efficiency against business as usual scenario	15%	by 2014
4. Carbon dioxide emissions reduction (in 2000 levels)	14%	by 2014

WC to establish CDM office for the Province – support development of programmatic CDM projects

- Who will be responsible for implementing the required by science route?
- Primarily cities!

Executive Management Team Sub committee: Energy & Climate Change

Chair: Exec Dir: Strategy and Planning Piet v Zyl

	Focus areas	Actions / business plans
1	Monitor, evaluate and review E&CC Strategy	<ul style="list-style-type: none">▪ Set up M&E system for all E&CC activities▪ Set up review system for E&CC Strategy
2	Oversee and facilitate implementation of action plans as produced by work streams 2 – 4	<ul style="list-style-type: none">▪ Oversee and facilitate development of action plans by the work streams 2-4▪ Oversee and facilitate implementation of action plans▪ Assess achievement of KPAs on Score Cards
3	Management of energy savings and carbon trading	<ul style="list-style-type: none">▪ Establish mechanisms for managing energy savings▪ Establish systems for carbon trading and management of carbon income

Work stream 1: Energy Security and Carbon Mitigation

Chair: Director: Budgets; Exec Director: Utilities

	Focus areas	Actions / business plans
1	Electrical efficiency (10%+ electricity saving)	Management of demand and supply Sectoral action plans for : <ul style="list-style-type: none">• Industrial• Residential (SWH programme!)• Commercial• Buildings
2	Energy supply security	Diversification of sources of supply Generation by City Energy efficiency across all sectors Load management
3	Council operations and systems	Action plans to cover : <ul style="list-style-type: none">• Buildings and other facilities (workshops etc)• Water pumping / sewerage pumping• Waste minimisation and methane projects• Fleet tenders and management• Greening of the procurement policy Institutional development: eg management of CERs, energy savings

Work stream 1 cont: Energy Security and Carbon Mitigation

Chair: Director: Budgets; Exec Director: Utilities

	Focus areas	Actions / business plans
4	Renewable energy and cleaner energy sources	Action plan for RE development <ul style="list-style-type: none">▪ Financing▪ Tariffs▪ Network development / management▪ Power Purchase Agreements▪ Support to Independent Power Producers
5	City form and urban edge	Spatial development which prioritises energy efficiency <ul style="list-style-type: none">• Development of activity routes, densification, urban edge• Priority given to public transport over private
6	Transport Energy	Metropolitan Transport Authority Plans to promote: <ul style="list-style-type: none">▪ Public transport▪ Alternative fuel and fuel efficient vehicles▪ Non-motorised transport▪ Energy efficient traffic management

Work stream 1 cont: Energy Security and Carbon Mitigation

Chair: Director: Budgets; Exec Director: Utilities

	Focus areas	Actions / business plans
7	Low carbon economy and Local economic development	<ul style="list-style-type: none">• Development of low carbon growth path for the City• Local energy business support and development

Work stream 2: Adaptation and Climate Resilience

Chair: Director - Environmental Resource
Management Ossie Asmal

	Focus areas	Actions / business plans
1	Adaptation	Plan to reduce / contain impacts Risk analysis incorp. into spatial planning and infrastructure planning and management Disaster Management
2	Access to energy for the poor and building climate resilience	Identification of vulnerable communities – especially low income Prioritisation of interventions: <ul style="list-style-type: none">▪ Energy sources – safe, affordable, efficient▪ Energy efficient housing (ceilings in all houses, compact housing)▪ Well located housing▪ Food gardens▪ Water tanks

Work stream 3: Communication and education

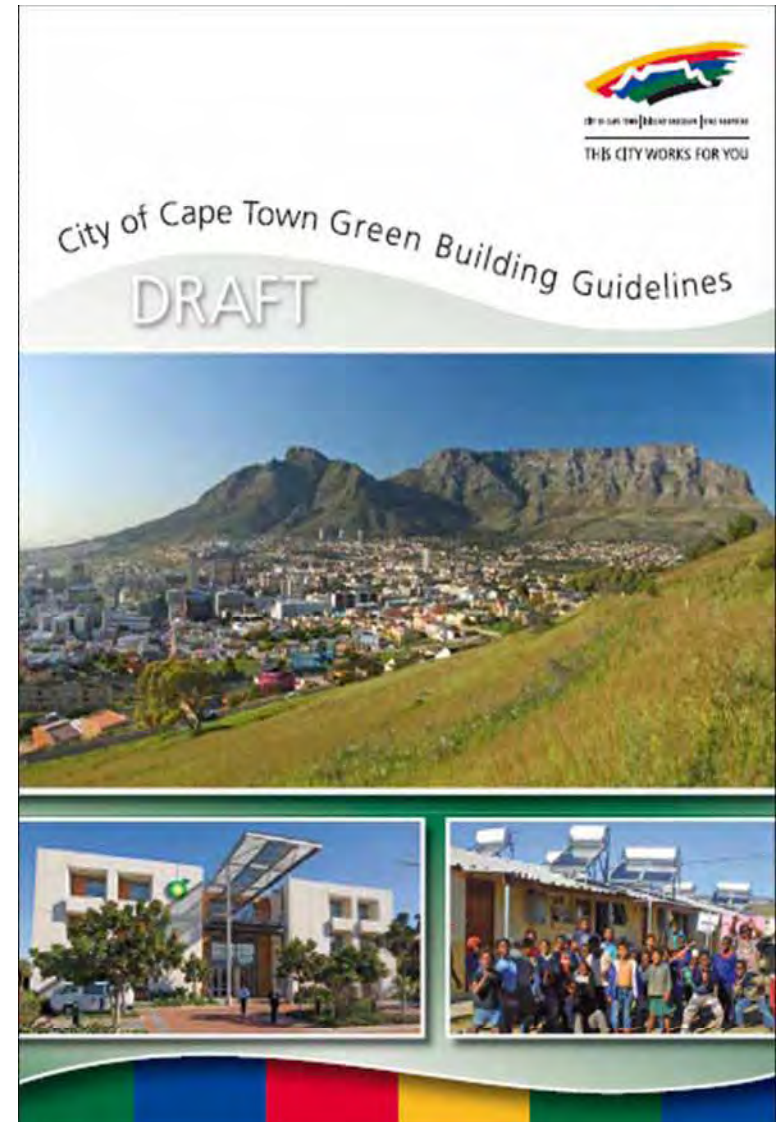
Chair: Director Communications, Pieter Cronje

	Focus areas	Actions / business plans
1	Overall communication of new energy future for Cape Town	Energy efficiency, public transport, renewables, solar water heaters, recycling. low carbon economy..... Council leading by example
2	Internal education and communication plan	All city departments
3	Sectoral communication and education plan	Plans addressing characteristics and needs of different sectors and income groups

Plans, policies and projects

Existing policies and plans

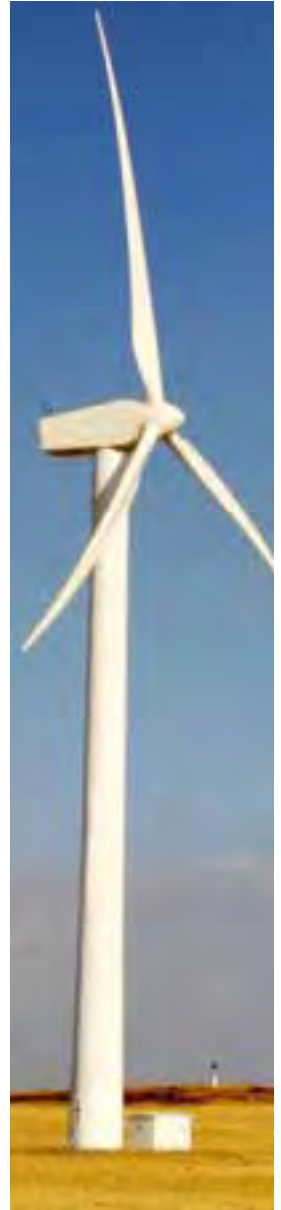
- Integrated Metropolitan Environmental Policy (IMEP)
- Energy and Climate Change Strategy 2006
- Air Quality Management Plan 2006
- Air Quality By-law
- Integrated Transport Plan 2006
- Integrated Waste Management Plan 200.. By-law in development
- Green Building Guidelines





Projects

- Energy efficient housing
- Electricity consumption reduction
- Energy efficiency
- Renewable energy
- Council operations
- Carbon trading
- Adaptation



EE housing: building climate resilience

Low income housing projects

- Kuyasa: first CDM project in Africa; 2300 units with ceilings, ee lighting, low-flow, SWHs
- Council rental stock upgrade (CRU project): Phase 1: 8000 units (total = 40 000 units). Resource efficiency – ee lighting, low flow, ceiling insulation, SWH .
- Greening of greenfields housing developments
- Programmatic CDM potential under investigation



Electricity consumption reduction

- Power Conservation Programme (as per Eskom instructions)
- Communication campaign
- Green Buildings Guidelines
- Energy Efficient water heating by-law – being prepared to go out for public participation
 - Workshops with industry / installers / possible endorsement of companies by Council
 - SWH in reserves / other council facilities

Renewable energy

- Darling Wind power purchase agreement – current development of green power purchasing scheme – green energy certificates
...REFIT implications



- RE development for City:
 - Net metering
 - Micro turbine regulations
 - Support for RE Independent Power Producers
 - Increasing City's share of green power



Council operations

- Energy efficiency in Council Buildings Programme:
 - 550 Council buildings/facilities – info on these very scanty
 - 2 pilot buildings done early 2000s....?
 - now priority 13 large office buildings assessed
 - 3 identified for retrofitting (Danida funding) 09/10
 - business case for remainder before Mayco for budget allocation.
- Greening of Procurement Policy: fuel efficiency in fleet tenders etc
- Landfill gas – MoU with CEF to do feasibility
- Water: energy efficient pumps? Mini-hydro?
- Sewerage biodigestors?
- Etc...?



Transport

- Bus Rapid Transit programme as part of Integrated Rapid Transit programme
- Non-motorised mobility programme
- Fleet
- Urgently need Metro Transport Authority

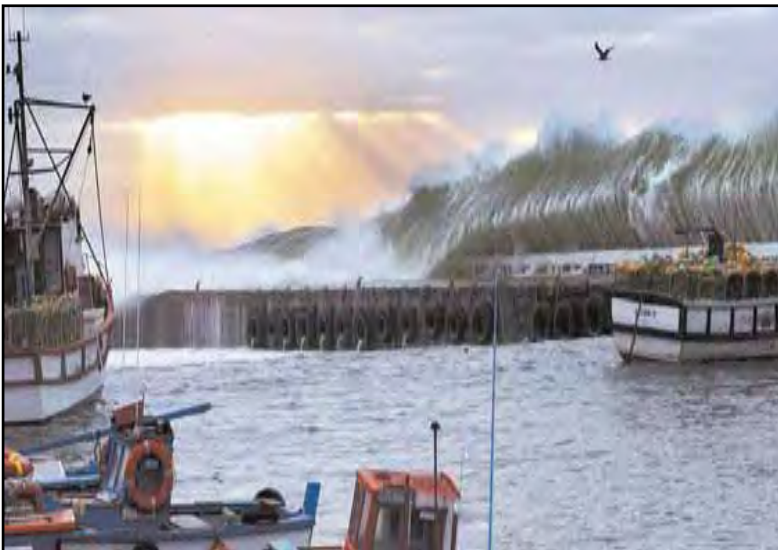


Adaptation research and responses

Sea level rise risk analysis:

Impacts on current infrastructure and parameters for future city spatial and built form development

- Sustainable Development Frameworks: integration into Environmental Management Frameworks and Spatial Development Frameworks
- Disaster Risk Management responses



City Adaptation Plan of Action

- Integrate projected climate change impacts into strategic planning and risk management activities within the City's line functions
- To assist the City to adapt to climate change by identifying climate change adaptation actions for implementation



Image Analysis ▾ Layers: Cape_Town_10m_prov.img Model Types: Spot

3D Analyst ▾ Layer: Cape_Town_10m_prov.img

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 - UGcable17m
 - OHline17m
 - sewer
 - stormwater7
 - SDE.SDE.MAPSUB
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 - 6.000000001 - 6.5



Display Source Selection

Drawing ▾ 10

-53043.216 -3778436.318 Meters







ADDRESSES PROJECTED IMPACTS IN THE CITY ON:

- Urban water supplies – bulk water, liquid waste
- Storm water and catchment management
- Biodiversity
- Livelihoods
- Health – direct and indirect impacts
- Coastal zones
- Solid waste
- Transport – rail, roads and public transport
- Spatial and town planning
- Housing
- Education and communication
- Disaster and risk management

Awareness

- Communication campaign:
Cape Town: New Energy City
- Youth Environmental Schools programme – YES
- Environmental magazine and web information
- Smart Living Handbook – business, households and schools



Carbon Work Group

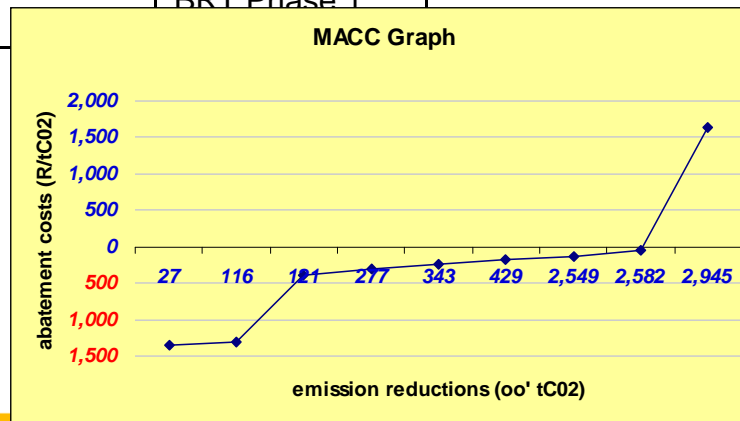
Cross-departmental (20 members) including legal and finance departments

Activities

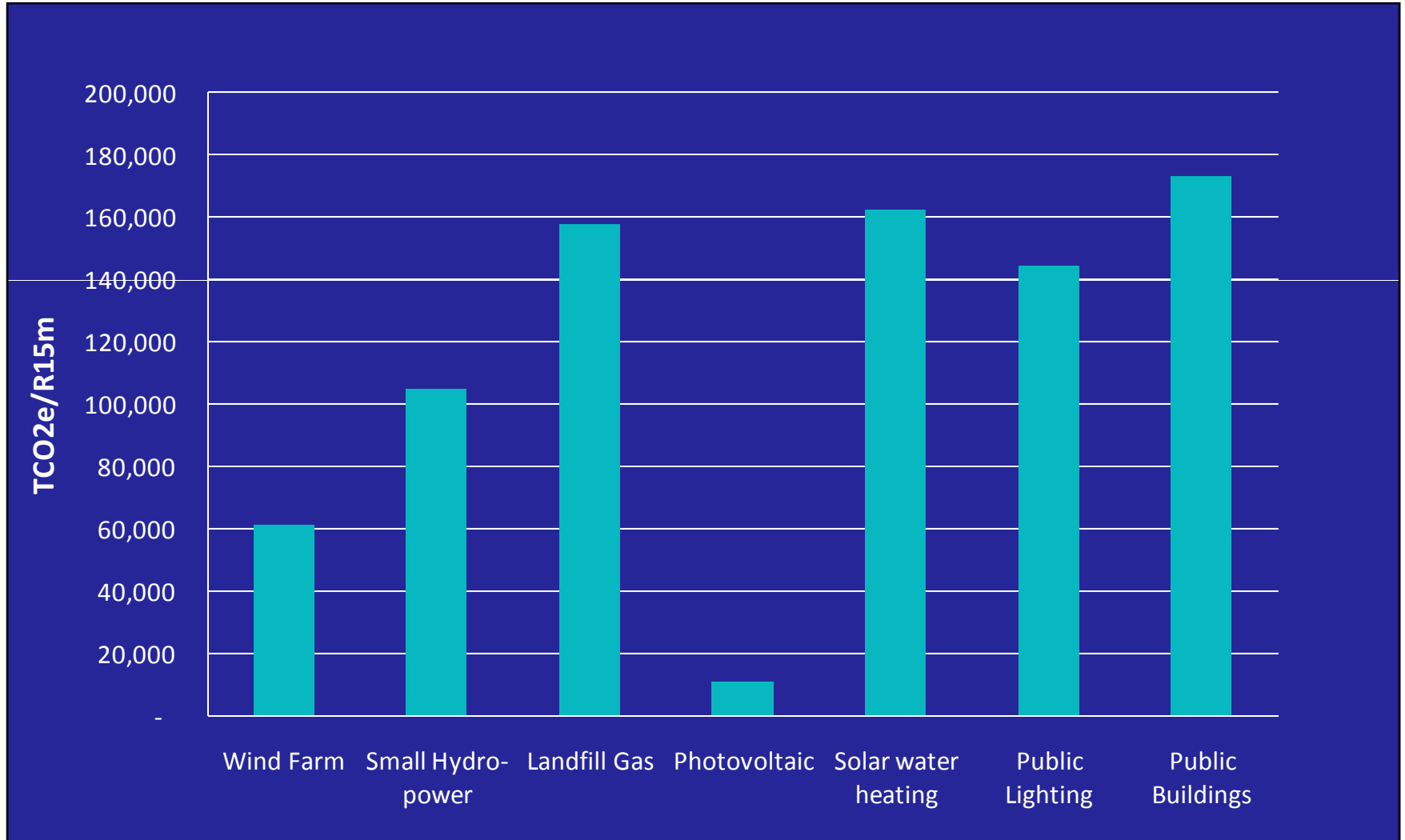
- Carbon projects scoping
- Development of Council Carbon Trading Policy
- Preparation for trading of all projects with carbon emission reduction potential
- Where appropriate:
 - CDM
 - Programmatic CDM
 - Voluntary trading
- Management of carbon income

Carbon projects analysis

	Label	Emission Reductions (tC02)	Abatement Costs (R/tC02)
Park and Ride	Park & Ride	26,532	1,340
EE of low cost greenfields housing developments 8,000 ceilings (one year)	EE Housing	89,946	1,302
Retrofitting of traffic lights with LED's	Traffic Lights	4,928	399
SWH bylaw, 10,000 units pa on mid to high income	SWH bylaw	155,676	313
EE retrofits to council owned buildings and facilities; 16 buildings initially, 200 in total.	EE Council Buildings	65,730	231
Kuyasa EE in low cost housing (2300 units)	Kuyasa	86,487	169
Landfill gas to energy W C	Landfill Gas	2,119,563	132
Retrofitting of street lights to high pressure sodium	Street Lights	32,976	57
Integrated Rapid Transport System - Phase 1	BRT Phase 1		1,646



Carbon emissions mitigated



2010 Carbon Offset Projects

- Energy management system in Green Point Stadium
- Hot water systems in Green Point Stadium
- Lighting in Phillipi Stadium
- Public lighting and robots along 2010 routes

- Climate Ticket – organic soil
- etc

Energy & Climate Change Research – Danida funded (R2.5m)

- **Mitigation and Adaptation**

- Reference Group of ‘experts’ to oversee research and analysis and build a resource of experts for Cape Town and other cities
- UCT Energy Research Unit, African Centre for Cities, Sustainable Energy Africa, CSAG, CSIR, etc
- SEA managing funds

- **Content:**

1. Cape Town Energy Futures Modelling – scenario building, comprehensive cost benefit analysis including carbon projects income scoping
2. Extension of sea-level rise / precipitation research
3. Development of an adaptation/disaster risk response decision making matrix (planning tool)
4. Workshops on process and outcomes with other SA cities

Critical issues for development of E&CC sector

➤ Institutional

- Cross cutting sector – need great deal of coordination between departments
- New area for the City to engage in – no blue print
- Lack clarity re EDI/REDS restructuring process
- Support for City initiatives from Province and National

➤ Legal

- MFMA and associated procurement complexities
- City mandates regarding energy
- Dependence on national developments (feed-in-tariff, subsidies for SWHs etc)

Critical issues for development of E&CC sector

➤ Staff capacity

- Need dedicated staff in a number of positions and departments
- Complex and new sector – variety of specialist skills needed

➤ Finance

- New area for City to finance, but also an area which can realise significant savings and income – ring fencing of carbon income and energy savings?
- City 'dependence' on income from electricity sales for cash flow and to subsidise activities
- Upfront capital to implement projects
- Carbon income risk

Thank you

Sarah Ward

Energy & Climate Change

City of Cape Town

