Towards a low carbon city: the case of Durban

1 Setting the scene

Towards a low carbon city

A few months before the COP17-CMP7 Meeting (The 17th Conference of the Parties – COP17) to the United Nations Framework Convention on Climate Change (UNFCCC) and the 7th Session of the Conference of the Parties serving as the Meeting of the Parties (CMP7) to the Kyoto Protocol, held in Durban in November and December 2011, the report “Towards a Low Carbon City: Focus on Durban” was released by the Academy of Science of South Africa (ASSAf) (ASSAf 2011). The report, the first of its kind in South Africa, had been commissioned by the eThekwini Municipality, the local government of the City of Durban, and was aimed at identifying key areas of intervention that would position Durban on a pathway towards a low carbon city.

This report and its findings serve as the basis for this article, which is aimed at critically reflecting on the various challenges and constraints confronting the city, and the failures and successes characterising the city of Durban in its transition to a low carbon city. Durban is one of the leading cities in South Africa, and indeed the African continent, in terms of climate change initiatives and is the first city to promote a comprehensive approach to low carbon urban development.

Local context

Durban is a harbour city on the shores of the Indian Ocean, with approximately 3.4 million inhabitants (as of 2010) and the second largest city in South Africa. It extends over an area of about 2 300 km², and its harbour is the largest one on the African continent. The municipal area of Durban is classified as 36% rural, 29% peri-urban and 35% urban (ASSAf 2011).

The apartheid history of the city is still evident in its racially segregated socio-economic character and urban land use pattern. Durban is facing high levels of poverty and unemployment. One-third of the city’s population is characterised as poor and over one-third of the economically active sector of the population is unemployed (ASSAf 2011:37). The racial inequality in the city is reflected in the fact that 93.5% of poor households are African, 0.1% White, 1.2% Coloured and 5.2% Asian. (ASSAf 2011:36-37). Apartheid spatial planning policies that promoted dormitory townships on the outskirts of the urban area, as well as a modernist planning paradigm that favoured individual dwellings on their own piece of land have led to urban sprawl over the past 70 years.

Almost one quarter (24.5%) of the city’s households, totalling 948 000 units, are in-
formal or traditional dwellings (cf. ASSAf 2011). The city of Durban delivers approximately 10% (as of 2010) of the national Gross Domestic Product (GDP) and ranks third – after Johannesburg and Cape Town – in terms of economic urban activities. The city's economy is dominated by the tertiary sector, including wholesale/retail trade, communication, transport/storage, financial/business services as well as community services. The manufacturing sector has declined in importance. Industry, commerce and agriculture are the most prominent energy-consumers (47%), followed by transport (42%), the residential sector (10%) and the local authority (1%) (cf. ASSAf 2011).

In terms of energy consumption and greenhouse gas (GHG) emissions, the city consumed a total of 133.7 million GJ of energy and emitted approximately 22.5 million tons CO$_2$e (2005/06 figures). This corresponds to nearly 5% of the national GHG emissions and results predominantly from the industrial sector (45% share), followed by 25% for the transport sector, 17% for the residential sector and 8% for the commercial sector. The industrial sector's contribution can be split into 52% derived from electricity consumption, 17% from the use of coal and 15% from refinery gas (cf. Antoni 2007).

The transport system of the city of Durban is dominated by roads, with a north-south oriented corridor comprising the major highway route, as well as a railway link serving mostly commuters. There is high reliance on private vehicles, although the city intends to try to reduce this and is planning for a modal split between public and private transport of 55:45 by 2020 (cf. ETA 2010). The harbour of Durban is located in the city centre, whereas the King Shaka International Airport is located in La Mercy, 35 km north of the city.

The natural environment of the city of Durban is characterised by D'MOSS – the Durban Metropolitan Open Space System – which is considered to be a central element for low carbon urban development in the sense of serving as a carbon storage system (cf. below and ASSAf 2011).

There are two integral spatial planning instruments that are pertinent for the eThekwini Municipality: the Integrated Development Plan (IDP) and the Spatial Development Framework (SDF), both of which are produced on a regular basis. These documents are accompanied by a vi-
Amongst the most prominent ones are:

- **Midrand Plan of Action** (launched in 2005)

Based on the Conference on Climate Action Now held in Midrand in 2005, this plan comprises a number of governmental activities aiming at a future perspective for national climate change programmes, including scenario-building.

- **Long-Term Mitigation Scenarios (LTMS, developed in 2006)**

Taking up one of the recommendations of the Midrand Plan of Action, a national process was mandated by the National Cabinet to map future greenhouse gas (GHG) emissions and thus illustrate a way in which South Africa could respond to article 2 of the United Nations Framework Convention on Climate Change (UNFCCC), while simultaneously focusing on poverty alleviation and employment provision. Cities have a pivotal role to play in this respect.

**National context of South Africa**

In parallel with having hosted some key international conferences (e.g. the World Summit on Sustainable Development held in Johannesburg in 2002 and the COP-17-CMP-7 Meeting in 2011), South Africa has developed, over a period of more than a decade, national policies and programmes on climate change.
regard to cumulative energy-related greenhouse gas emissions “74% higher than the global average, 344% higher than China, 471% higher than Brazil, 900% higher than the average of sub-Saharan Africa, 33% lower than the EU and 70% lower than the USA” (ASSAf 2011: 76).

2 Transitioning to a low carbon city – challenges, constraints and first successes and failures

General opportunities and constraints

Durban and the eThekwini Municipality have committed themselves to transitioning to a low carbon city (cf. ASSAf 2011). Several opportunities, including their constraints, are given. Key interventions that could relatively easily be achieved include energy savings through increasing the energy efficiency of buildings and requesting large industrial consumers of electricity to reduce their consumption, as well as substituting fossil fuel energy supplies with renewable energy sources. Due to the fact that the current transport pattern heavily relies on private transport, as well as the harbour of Durban attracting and generating large volumes of freight, which is transported mainly by road, little progress has been made thus far in the transport sector in advancing the principles of a low carbon economy.

- National Climate Change Response Policy Green Paper (published in 2010)
  The LTMS exercise emphasised a peak, plateau and decline of greenhouse gas emissions, which in return has constituted the legally non-binding basis for the National Climate Change Response Policy Green Paper. It intends to ensure that South Africa will be able to meet its commitment to a reduction of greenhouse gas emissions.

  Hand in hand with the Green Paper goes the White Paper on Renewable Energy Policy, targeting the provision of a minimum of 27% of national energy supply from renewable energies by 2030.

  Both documents gave birth to implementing the concept of a green economy – as developed in the context of the Organisation for Economic Co-operation and Development (OECD) and other institutions – and highlight its crucial role for sustainable development.

Reducing energy consumption and thus CO₂ emissions has been a national priority in recent years as South Africa had been classified for the period 1950–2000 with regard to cumulative energy-related greenhouse gas emissions “74% higher than the global average, 344% higher than China, 471% higher than Brazil, 900% higher than the average of sub-Saharan Africa, 33% lower than the EU and 70% lower than the USA” (ASSAf 2011: 76).

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![Figure 5](image-url)

**Figure 5**
**Greenhouse gas emissions scenarios (2003–2050) described by LTMs**
Enhancing carbon sinks

Taking into account the urban and landscape fabric of Durban, the most place-based approach in transitioning to low carbon urban development by means of town planning is seen in fostering carbon sinks (cf. ASSAf 2011), i.e. D’MOSS would constitute a crucial area of intervention here.

D’MOSS comprises 74 857 ha, consisting of approximately 29% thicket, 22% woodland, 17% forest, 20% grassland, 9% freshwater wetland, 3% estuary and 3% artificial waterbody. Scientific estimations suggest that...
the open space could reach a long-term carbon storage (sequestration) for a decade or two of about 64 x 103 t carbon per year. Compared to the city’s CO₂ emissions (cf. aforementioned), this rate is relatively small, yet enhancing carbon sinks through management of open spaces offers a promising and an easy-to-implement-approach. Fostering reforestation (e.g. Buffelsdraal and Inanda Reforestation Projects) and avoiding deforestation, managing biomass flows, as well as greening roofs and paved areas (e.g. the Green Roofs Pilot Project and the City Veggie Gardening Project) would be feasible, yet small-scale alternatives (cf. ASSAf 2011).

Putting a low carbon society into practice requires both, voluntary efforts of individuals and target-oriented and efficient governance at the local level, the level closest to citizens and hence the most appropriate level for interventions. Particularly against the background of the apartheid-influenced scattered urban fabric of Durban and low incomes of most of their citizens, strategies that follow the low carbon principle should address the diverse lifestyles of citizens and provide local authorities with optimum governance structures to shift to low carbon cities.

EThekwini Municipality has taken the first steps on this pathway (cf. ASSAf 2011), e.g. by raising the profile of climate change matters on the Council agendas, and with the Energy Office reporting directly to the Treasury Department on issues related to...
climate change mitigation. Demonstration projects (cf. aforementioned) are established in highly visible locations, and partnering with the private sector through the Chamber of Commerce is being established. A consumption-based accounting approach has already been applied in the case of electricity consumption.

Altogether, regulations, economic incentives (e.g. savings generated by the use of solar power or voluntary carbon offset markets), awareness-raising, developing values as well as ethics of care and using rhetoric to persuading citizens to change their lifestyle are essential in further enhancing low carbon citizenship.

Constraints and challenges in implementing the concept of a low carbon society in the city of Durban are manifold, primarily related to an unequal society rooted in the historical legacy of apartheid. Key factors are: lack of information about climate change; costs of transport infrastructure; lack of financial resources; implementation deficits; inadequacy of the behavioural approach; confusing, and sometimes conflicting, information sources; awareness-raising aimed at the individual; managerial, technicist approaches to carbon reduction; absence of a low carbon citizenship social norm; polarisation of environment and development; differential energy pricing favouring large consumers; dominance of scientific knowledge in climate change information; high crime rates hampering the advocacy of walking and cycling options as part of a shift to low carbon behaviour, and – last but not least – an enforcing neoliberal individualisation.

The Imagine Durban Vision (cf. aforementioned) and its programme for schools represents one of the best available documents combining green issues (related to climate change) and brown matters (related to development) and thus raising awareness amongst the next generation (cf. ASSAf 2011).

Fostering a green economy for eThekwini Municipality

Green economic development has emerged to be of crucial importance for both, policy making and programme setting in South Africa. Implementing the concept of a green economy is understood as a competitive advantage for low carbon cities, such as Durban, in order to enhance their reputation. The green economy, in this context, relates to green sector development, green purchasing and green collar job creation (cf. ASSAf 2011).

Key drivers for successfully transitioning to a green economy have been identified by the United Nations Environment Programme (UNEP). Those applicable at a local level are: establishing sound regulatory frameworks, prioritising investment and spending in areas stimulating greening of economic sectors, and investing in capacity building and training (cf. UNEP 2011).

In the context of eThekwini Municipality, specific interventions for transitioning to a green economy are as follows: invest in natural capital; invest in urban agriculture and thus contribute to alleviating poverty (by encouraging market gardening); and green the water, energy, waste, tourism, transport, industrial and building sectors. In addition, sustainable human settlements and green investment and procurement should be promoted (cf. ASSAf 2011). It is clear that while one might be able to stimulate some individual initiatives, the promotion of initiatives such as investment incentives and skills transfer would need state intervention to flourish.

Financing a low carbon city

Addressing financing opportunities for low carbon urban development requires a full understanding of the driving forces of GHG emissions in a city and its surrounding region. Financing options recommended for the city of Durban include the following (cf. ASSAf 2011):

- Clean Development Mechanism (CDM), providing funds for projects in South Africa that lower CO₂ emissions to obtain financial support from industrialised nations having binding emission reduction requirements related to the Kyoto Protocol in return for verified Certified Emission Reductions (CERs)
- Supporting energy service companies
- Financial sector lending programmes (for example, the German KfW New Building Modernisation Programme)
• Municipal bonds (for example, the Mo- sone Civic Centre in San Francisco fi- nancing photovoltaic systems and energy efficient lighting)
• Economic and infrastructure develop- ment funding alignment
• International funding (e.g. the World Bank’s Global Environmental Fund – GEF) and the CDM Adaptation Fund (sourced from a 2% tax on issued CDM credits)
• Private sector financing (e.g. private ven- ture capital funds).

It was recommended that the eThekwini Municipality’s Energy Office should coordinate a financing strategy to accompany the transformation to a Low Carbon Durban.

Twelve transferable policy recommendations

Based on the findings outlined in the ASSAf Report, twelve strategic recommendations for low carbon urban development, that are applicable also to other municipalities in South Africa and more generally to cities in other developing countries, are (ASSAf 2011: 21-22):

• Ensuring a shift towards a green economy
• Emphasising climate change co-benefits
• Ensuring a multi-level governance ap- proach
• Promoting low carbon consumption
• Ensuring the implementation of low car- bon land use planning
• Ensuring the integration of mitigation and adaptation activities
• Ensuring and recognising visionary lead- ership
• Giving urgent attention to the transport sector in the transition to a low carbon city
• Ensuring a strong mitigation focus in the industrial sector
• Ensuring a broader focus on the built en- vironment
• Maximising local opportunities in the low carbon transition process
• Encouraging innovation through a part- nership-based approach

3 Conclusion

Cities are key drivers of climate change and climate change actions. Over 50% of the world’s population lives in cities and this fraction is expected to increase to 70% by 2050 (UN 2007). Most of the activities producing GHGs are based in cities, placing cities centre stage when it comes to mitigation and adaptation interventions.

The relevance of low carbon development in a city like Durban in a developing country context is considered in this ASSAf report and has shaped the recommendations made for low carbon transitioning. Key considerations are the opportunities presented to couple economic development imperatives with low carbon options.

References

Imagine Durban, 2009: Imagine Durban Long-Term Plan. Durban.