African Cities and Renewable Energy: The Case of Cape Town, South Africa

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Introduction: Urban Africa

In the next two decades, two major trends are set to impact Africa's urban landscape. For one, an increasing number of people in all parts of the continent is expected to live in urban areas. This is part of a broader trend, with an estimated 60% of the world population expected to live in urban centres by 2030. However, the speed of urbanisation in Africa is higher than elsewhere on the planet and many therefore expect a disproportionally high impact on African city life. According to the UN, Africa's growth rates of nearly four per cent are nearly twice the global average (UN Population Division 2001). If these predictions are correct, Africa will host 17 per cent of the world's urban population in 2015 (ibid).

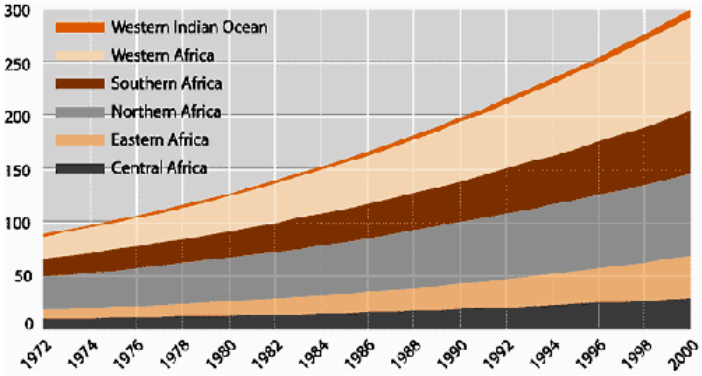

Figure 1: Urbanisation in Africa from 1970s to 2000. Source: UNEP 2010.

Second, gradual economic growth across Africa will continue to enhance people's lifestyles, leading to an increase of individual consumption. As economic development concentrates in urban areas, people in Africa's cities can be expected to consume much more in the future than they do in 2010. If this holds true, energy demand, too will increase significantly – which is also a global phenomenon. According to the Energy Information Administration (EIA), the total energy demand in the non-OECD countries will increase by 73 percent, compared with an increase of 15 percent in the OECD countries (EIA 2009). The International Energy Agency (IEA) confirms these figures: "by 2030 over 80% of the projected increase in demand above 2006 levels will come from cities in non-OECD countries" (IEA 2009).

Given these two trends, the question is whether and if so how people in Africa's fast-growing cities can be provided with sufficient energy resources in order to manage urban growth in the coming decades. Generally speaking, this is the responsibility of national authorities, as the mandate for energy generation does not rest with municipalities. However, urban centres, in particularly in Africa, often are major centres of political power and receive much attention from national policy-makers. Energy supply (and more importantly the lack thereof) might therefore soon become a much more important topic on national politicians' minds as a result.

While most of the African energy demand is likely to be covered by energy from fossil fuels, rising oil prices and the need to complement current supply with additional electricity could present an opportunity for cities to turn towards a green energy agenda in order to secure the needed levels of energy. By doing so, one can make a distinction between three complementary strategies (see figure 2 below). First, cities can aim to limit the demand for energy in the first place. Second, municipalities can decide to promote renewable energy. The third option includes a more efficient use of fossil fuel-based energy.

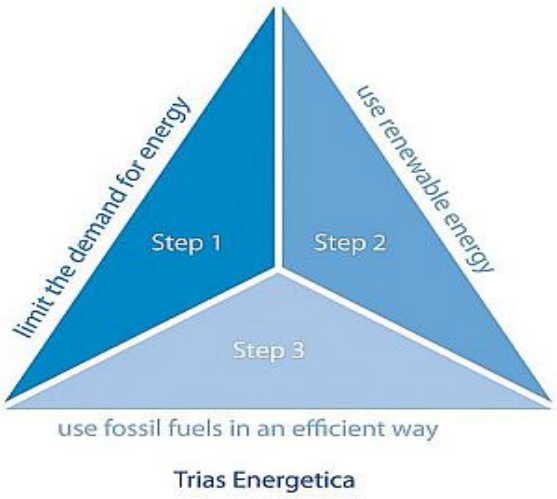

Figure 2: The 'trias energetica' includes the three possible strategies of a green energy agenda. Source: Novem.

In this light, it is of particular interest to look at step 2. Where energy demand grows fast in emerging market cities, embracing step 1 as the only strategy might not be enough. Further, step 3 might prove as expensive as introducing new technologies for renewable energy. For cities to secure energy supply, it might become key to facilitate the introduction of renewable energy. Often, these alternative energy technologies are by definition of a more decentralized nature, and can complement national, centralised energy generation. Much of these developments still have an experimental character and can be prohibitively costly. One should therefore be careful not to overestimate the impact of renewable technologies for cities, and African cities in particular. At the same time, technological advances in this field are moving quickly, and it is worth looking into opportunities for fast-growing urban centres. Taking these considerations as a starting point, this article looks at the role of city authorities in safeguarding urban energy supply through the promotion of renewable energy.

Defining Green Growth Strategies

Renewable energies have thus far not penetrated far into African (city) politics. The same accounts for sustainability as an overarching concept for national policies. While there is an increasing push towards 'greening' policies in Europe and United States, African governments are much less active when it comes to promoting a green agenda. Africa's share of Clean Development Mechanism (CDM) projects for example, where CO2 credits generated in Africa can be sold to overseas buyers within a growing global emissions trading system, is minimal. According to the United Nations Environmental

Programme (UNEP), the continent's overall score for CDM projects stands at 870 in total, which represents a mere 2,6% worldwide. Confirming Africa's reluctance to finance proactive green policies, African leaders recently called upon rich nations to pay for climate change adaptation (not mitigation) measures in the developing world during the Copenhagen Summit in 2009. Notwithstanding this seemingly discouraging picture, this is not to say that there are no other initiatives that are worth investigating.

When looking at the urban context, it is useful to make reference to the concept of 'green growth strategies', which is used by the Organisation for Economic Cooperation and Development (OECD) in order to define policy-choices in the field of sustainability: "[a] growth strategy that accounts for increases in public and private investments and consumption leading to sustainable resource use, lower greenhouse gas emissions, and reduced vulnerability to climate change" (Kamal-Chaoui et al 2009). This is a fairly comprehensive definition, including various elements of a green agenda. It combines economic growth and the need to 'account for' the environmental impact of economic development.

In order to discuss how urban centres deal with economic growth on the one hand and the environmental footprint on the other, it might be useful to divide what the OECD defines as 'green growth' into two separate, interrelated aspects. On the one hand, economic growth can be achieved with a view to limit its environmental impact. On the other hand, economic growth can be driven by the need for environmentally friendly solutions and products. The first could be called 'green-conscious growth', whereas the latter could be labelled 'green-driven growth'. The figure below illustrates this line of thought. It is important to note that all three aspects of the *trias energetica* apply to each of these two strategies. Both green-conscious growth and green-driven growth impact on energy demand (step 1), energy supply (step 2) and energy efficiency (step 3).

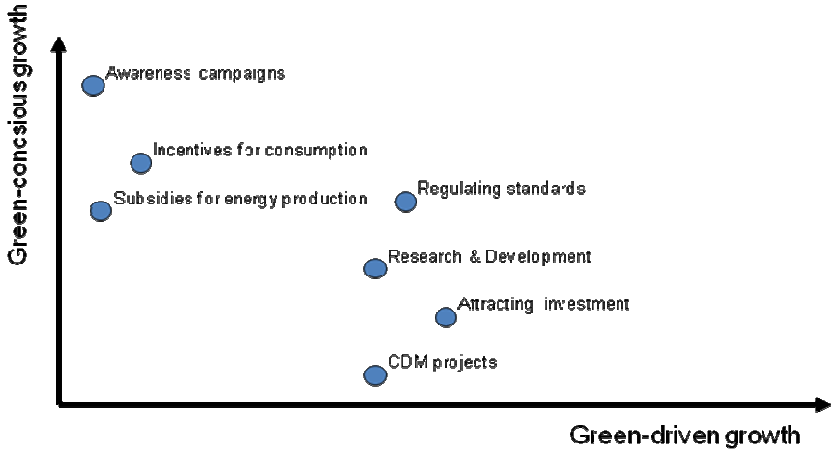

Figure 3: examples of green growth initiatives: green-conscious versus green-driven growth

In emerging markets like China, India and Brazil, the concept of green-driven growth does provide an interesting starting point to analyse how economic growth in urban regions stems from investments that benefit from a green agenda – whether profits come from domestic or international buyers. For example, a city with an emerging green industrial base can produce key components for the green energy industry, such as biofuel refinery manufacturers in Sao Paolo or the fast-growing solar PV panels industry in China's Wuxi. In Africa, this type of green growth is not (yet) to be seen. In fact, major industries in the green energy sector still have a very limited presence on the continent.

There are merely 60 corporate headquarters across the African continent, in contrast to for example China with 735 headquarter locations.[i] Out of these 60 locations, the majority can be found in two countries (26 in South Africa and eight in Kenya); 16 countries host the remaining 22 locations (see figure 4 below). A similar picture emerges when looking at the numbers of other locations (country offices or subsidiaries) across the continent. There are 198 African locations in total (in comparison with China and India: 437 and 706 respectively). Major hubs on the continent are South Africa (82), Egypt (26), Nigeria (21) and Algeria (13).

Some argue that this might change in the medium term. With projects such as *Desertec*, for which up to €400 billion could be invested in the next 40 years for installing solar power plants all across the North African deserts, Africa's solar resource might become a key selling point for international investors. The potential for wind and biofuel energy generation could similarly attract major interest in the coming years. For example, Brazilian refinery technology is already being exported to places like Sudan, where biofuel production in turn serves the EU market since 2009.[ii]

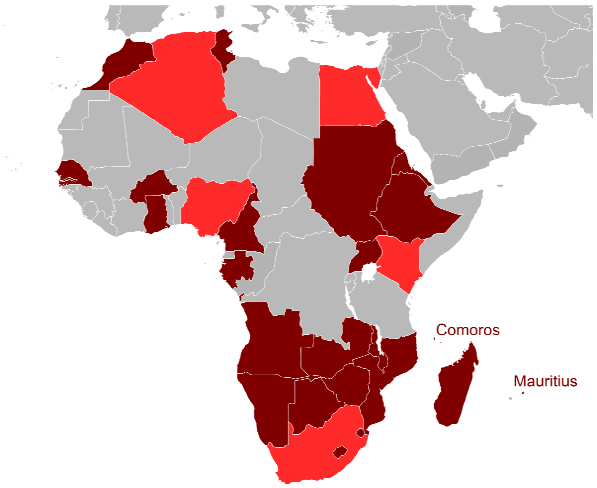

Figure 4: the renewable energy sector in Africa: countries with at least one company office (HQ, country office or subsidiary) in the renewable energy sector. Countries with more than 10 offices are light-shaded.[iii] Source: GlobalData 2009

At the time of writing however, green-driven growth remains an underdeveloped aspect of Africa's green economy. What about green-conscious growth? Many would argue that there are limits to what African states (or cities) could achieve in terms of an environmentally friendly growth agenda. The per capita CO2 emissions, an often quoted indicator, is the lowest in Africa, with 0.3 metric tons per year (Boden 2009), compared to for example 4.56 in China and 1.16 in India (2006 data).[iv] As a result, African leaders generally have limited incentives to make green energy supply a strategic priority. Given the anticipated growth of urban centres across the continent however, it is worth investigating examples where green-conscious growth is being promoted, and where developments are being spearheaded.

Unsurprisingly, such an endeavour quickly leads to the largest economy of the continent: South Africa. The country accounts for 25% of Africa's economic footprint (2005 data)[v], and tops nearly every single statistics in terms of economic development. If Africa's economic and demographic growth indeed leads to a greater need for cities to introduce

new ways for promoting green growth, South Africa's cities might offer some insights and relevant lessons learned.

Energy Supply in South Africa

Today, 45% of Africa's energy is consumed in South Africa, making the South African electricity sector an interesting – even though not representative – case study. The sector is regulated by the Electricity Supply Commission (Eskom), majority-owned and controlled by the national government. Eskom is a commercial entity and plays an active role in other parts of Africa regarding electricity supply through its subsidiary Eskom Enterprises. In 2008. the company made a net profit of ZAR974 million (Idasa 2010).

Eskom is the largest producer of electricity in Africa, among the top seven utilities in the world in terms of generation and among the top nine in terms of sales. It generates approximately 95 percent of the electricity used in South Africa. Its energy production is far from being on a greening path. With 90 percent of South Africa's electricity originating from coal, South Africa stands for one of the most polluting electricity supplies in the world.[vi]

In contrast to the highly centralised production, distribution involves more decentral levels of government. While all electricity generated by Eskom is being injected onto the national grid, Eskom does not distribute electricity to every consumer in South Africa. Most of the electricity directly goes to 36 large industrial consumers; the remaining electricity mainly goes to the three largest metropolitan areas (Johannesburg, Cape Town and Durban). Municipalities generally first buy their electricity from Eskom and then sell it to their citizens, often with a profit. These sales account for a significant part of the municipal revenues and in fact pay for the provision of other services.

In addition, all electricity that is not produced by Eskom has to be sold to the utility. So-called Independent Power Producers (IPPs) are obliged to sell their produced electricity to Eskom to feed into the national grid. In effect, this means that customers (like cities) who buy 'green' energy purchase the rights to the environmental benefits associated with the renewable energy. Because the electricity coming from IPPs is injected into the national electricity grid, it is inseparable from other kinds of electricity that are originated from other Eskom power stations.[vii]

Recent developments indicate major changes in the coming years. Eskom is under significant pressure to 'unbundle' the supply chain which it currently controls.[viii] In 2007 and 2008 there were serious national supply crises, coupled with nation-wide black-outs. In this context. the Public Enterprises Deputy Minister Enoch Godongwana stated that the South African government is going to "put an end to the chapter" of IPPs struggling to conclude power purchase agreements. He argued that "we cannot leave that issue to Eskom any longer".[ix] South Africa's president Jacob Zuma confirms this stance: "[w]e are creating a situation that in this area of energy which is so important that a player must come in and participate so we don't have Eskom doing everything". Accordingly, Eskom's autonomy to run the sector has suffered significantly. For example, when in 2008, the company aimed to introduce a 60 percent tariff increase, the national regulating body NERSA 'only' allowed an increase of 27 percent (Idasa 2010: 14).

One way of breaking up the Eskom monopoly includes allowing IPPs to produce renewable energy and feed it into the national supply. In March 2009, NERSA announced the first set of guidelines for this type of renewable energy feed-in-tariffs (REFIT).[x] Since then, many have hailed the decision, while others voiced critique towards the regulatory body. On the one hand, the tariffs for solar and wind are competitive in the international market and therefore create much interest among national and international investors. On the other hand, the total amount of energy produced by IPPs is capped, and Eskom still has the single responsibility for buying the energy. It also remains unclear how exactly power purchase agreements will be formulated. NERSA is expected to present the final PPA template in mid-2010. As a consequence, many investors stand ready to submit renewable energy projects under this REFIT scheme, however are waiting for the national law to come into force.

Cape Town's Green Agenda

Cape Town has been one of the more prominent cities outside the OECD that has put itself on a track towards renewable energy. Already in 2003, Cape Town became the first city in Africa to implement an Integrated Metropolitan Environmental Policy (IMEP 2003). In 2004, city authorities committed themselves to the introduction of solar water heaters across the municipality, and in 2005 established a dedicated office for renewable energy finance and subsidy (REFSO). In addition, Cape Town participates in the international association of local government for sustainability, (ICLEI) and is an affiliate member of the Renewable Energy Policy Network for the 21st Century (REN21). In 2006, the city presented a comprehensive Energy and Climate Change Strategy (ECCS), defining five energy visions.[xi] At the time of writing, the 2008 Integrated Development Plan (IDP) defines energy as a strategic focus for its 2020 long-term planning. A so-called executive management team on energy and climate change[xii] streamlines all activities in this regard and facilitates a to-be established committee of 11 councillors for energy and climate change.

	2005	2020	Total % increase
Population	3,088,400	3,900,000	26%
Households	772,000	995,880	29%
Low-income	240,000	309,600	29%
Mid/high-income	530,000	683,700	29%
Housing backlog	265,000	415,000	57%
GGP (billions rands)	97.2	140.8	45%
No. private cars*	584,545	822,440	41%

*Increase calculated by using 178 cars per 1 000 people (for 2000) and projecting the expected increase to 200 cars per 1 000 people onto the projected population.

Data sources:
State of Energy Report 2003; 2001 Census; 2003 Household Income Survey; 2002 Labour Force Survey; Energy Futures for Cape Town 2005, ERC.

Figure 5: Cape Town selected key data for 2005 and 2020. Source: Cape Town Energy and Climate Change Strategy (2006)

Cape Town's current policies are guided by a set of energy-related targets regarding electricity, heating and non-motorised transport (IEA 2009). Targets exist for renewable energy (10% of total supply in 2020), solar water heaters (10% of all households and

10% of municipal buildings by 2010), energy-efficient lighting (90% of all households by 2020); and efforts are in place to introduce non-motorised transport by 2015. In addition to the municipal decision to set specific targets, there are other ways to promote renewable energy. A recent IEA report presents 13 case studies world-wide (among which Cape Town) and identifies four additional policy options: sticks, carrots, guidance and action on municipal level (IEA 2009). Thus far, Cape Town has introduced concrete measures in all these five categories (see figure 6 below).

Target		Stick				Carrot						Guidance		Municipal operation			Role model	
Overall target	Sector specific target	Urban planning	Building codes regulations/codes	Taxes	Standards and mandates	Capital grants and rebate	Operating grants	Investment	Soft loans and guarantees	Tax credits	Tax reduction/exemption	Information/promotion	Training	Procurement/purchase	Investment	Utility	Demonstration/land use	Voluntary agreements
X	X	X				X						X	X	X				

Figure 6: IEA assessment of Cape Town policy choices regarding renewable energy.

For the purpose of this paper however, the focus rests on Cape Town's policy choices regarding the *generation* of renewable energy (step 2). This is markedly different to most discussions about sustainable energy policies, which are often limited to steps 1 and 3 activities of the *trias energetica*. Even though the local-level generation of renewable energy is an often overlooked aspect of today's resilient cities discussion, The following sections argue – based on the experience of wind energy generation – that municipal action can be a potentially valuable contribution to city policies.

Major Challenges for Municipal Energy Generation

Before turning towards the more concrete example of Cape Town's Darling Wind Farm, it is worth noting that South Africa's national context defines much of what can happen on local level in terms of renewable energy generation. Looking at the experience of Cape Town, there are three sets of challenges that impact on a municipality's ability to promote renewable energy generation: institutional, financial and political.

Institutional:
The mandate for energy generation in South Africa (and most other countries) rests with the national authorities. Even though cities sometimes own transmission lines and power generation infrastructure, all generated power flows into the national grid, and remains under the control of Eskom. City authorities do however have the mandate for energy distribution, and the responsibility for environmental policies also rests with the municipality. This opens the door for city authorities to establish policies aimed at influencing energy consumption behaviour within its jurisdiction.

Another key problem for active policy support regarding renewable energy stems from the acute lack of human resources. According to city officials, major factors that limited Cape Town's appetite for longer-term funding include the FIFA world cup, the economic crisis and fixed expenditures for the municipal rapid bus system IRTE. Only after several years of lobbying, the city's energy department is set to have five additional staff members from mid-2010 onwards.

Financial:
A major bottleneck for Cape Town's renewable energy ambitions lie in the lack of financial resources. Cape Town, as most South African cities, struggle with a long list of serious issues, including the gap between rich and poor, lack of basic services, unemployment, crime and insufficient housing. Budgetary priorities for municipal action therefore never placed electricity generation on top of the list. As one city official states: "just prior to a presentation about renewable energy, the mayor had been given an update on the enormous problems with municipal waste management – and merely stared at the wall during our meeting". The fact that renewable energy generation requires massive investments (12 million Rand per installed MW) does not help freeing financial resources on municipal level. In relative terms, renewable energy is simply considered too expensive in view of other problems.

Reinforcing the problem of budgetary resources, and as a direct result of the distribution mandate, the city finances are highly dependent on conventional electricity consumption – and de-facto benefit from a business-as-usual scenario. The municipal energy department purchases power from Eskom and sells it to end consumers. The administration fee the city charges for this transaction provides for a significant part of the municipal revenue. In other words, the more energy Cape Town transfers from Eskom to its citizens, the better for its treasury.

Political:
When looking at the political landscape in which Cape Town operates, it is important to introduce the role of the provincial government. The Western Cape is one of nine provinces in South Africa and has – with a surface area of 129.370 km² – a significant territorial reach (10% of the national territory). In terms of demographic and economic resources however, the Western Cape is largely defined by the city of Cape Town. As one provincial official states: "The Western Cape is little more than Cape Town plus a couple of farms and holiday houses".

In political terms, the interplay between municipality and province is much more significant. Until recently, the African Congress Party (ANC) was in charge of the Western Cape, while the Democratic Alliance (DA) held political control in Cape Town. As a consequence, officials point out, communication in the past was close to non-existent. Even though cooperation between city and province has recently improved with the DA in the driver's seat on both governance levels, political leadership regarding renewable energy initiatives remains limited. Despite existing policy guidelines as formulated in the ECCS, key actors within the municipal apparatus feel that political support has not been enough to implement the ambitious targets that were set in the past.

Renewable Energy Generation in Cape Town: Experiences from a Wind Farm

As energy generation has thus far attracted limited interest within the current academic discourse, current frameworks reflect a much broader vision on green energy. For

example, Bulkeley and Schroeder (Bulkeley & Schroeder 2009) distinguish between five types of policy choices for city authorities when dealing with renewable energy.

- *self-governing*, the capacity of local government to govern its own activities;
- *governing by provision*, the delivery of services and/or resources;
- *governing by regulation*, the use of guidelines and laws;
- *governing through enabling*, the use of demonstration projects, educational and awareness raising activities, plus research and development (R&D) support;
- *governing by partnership,* the use of public-private initiatives.

When narrowing the focus on the generation aspect of renewable energy, municipalities have significantly fewer options (Schoenberger 2010). Regulation and provision predominantly lie in the spheres of national and sometimes provincial authorities, not on the municipal level (see figure 7 below). As a result, city authorities find themselves in a much more facilitating role, including what Bulkeley and Schroeder would define as 'governing through enabling' and 'governing by partnership'. Self-governing also becomes a viable option, as municipalities can for example choose to purchase renewable energy for their own consumption.

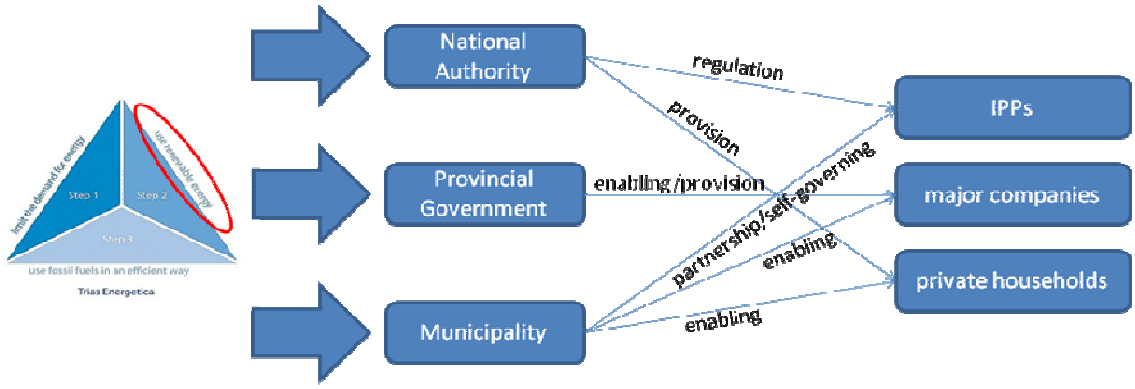

Figure 7: Policy options for municipalities in promoting renewable energy generation: regulation and provision are predominantly the realm of national and provincial authorities.

Even though the city of Cape Town has developed a wide range of policies towards a greener energy footprint (see above), most include demand reduction and energy efficiency measures. When it comes to local energy generation, neither companies nor households have been facilitated to become power producers. However, some major companies are working on plans to generate their own electricity (be it waste-to-energy, wind or solar). Contribution by households are limited to thermal (and therefore non-electric) energy, through solar water heaters which are promoted by both municipality and national authorities. However, there is one initiative that stands out as the only direct contribution to the city's green energy supply: the Darling wind farm.

The farm, located some 70 km north of Cape Town, is the first commercial utility-scale, renewable energy project by an IPP in South Africa (except for existing hydropower plants) and is the first Sub-Saharan African IPP wind farm project. The required capital has come from a group of companies including Darling IPP (Darlipp), the nationally-run Central Energy Fund Ltd. (CEF) and the Development Bank of Southern Africa (DBSA). Danish donor money provided an additional grant for the project. Initiated as a local initiative, it has become a national demonstration project and started to operate in May 2008 after two years of construction. On paper, the four 1.3 MW turbines are good for a total output of 13.2 GWh per year. The city of Cape Town signed a power purchase

agreement with the responsible IPP for 20 years, with a premium of 25c/KWh above the Eskom electricity price. From June 2010 onwards, Cape Town's energy department is set to sell this energy to selected consumers in the form of green electricity certificates.

Whereas on paper, Darling is often portrayed as a major success for Cape Town's green agenda, planning and implementation has not gone smoothly. Rather, this unique project provides valuable lessons learned on opportunities and challenges for municipal authorities when acting as a catalyst for local large-scale, commercial energy generation. The partnership between Cape Town and the Oelsner Group, the commercial entity behind the Darling wind farm, started with the conclusion of a power purchase agreement in 2006.[xiii] In effect, this municipal engagement provided the needed sales guarantees and made the project economically viable in the first place.[xiv] Eskom provides the transmission lines for free[xv] and the national government has labeled the farm a 'national demonstration project'. Overall, 2/3 of the project was government-funded. The special pilot status also made it possible to detour tender procedures, and to circumvent national power purchasing guidelines that foresee Eskom as the single buyer for power in South Africa.

A series of bottlenecks however lead to significant delay and disagreement between the parties involved. Thus far, only the first four out of ten turbines have been built on-site, and the anticipated turbine type was eventually replaced with a smaller one.[xvi] The resulting lower level of energy production have not been communicated in the official documentation about the project. In addition, maintenance contracts and related responsibilities are still unclear and subject to a court-case between the IPP and other financing parties. As a consequence, the implementation of the second phase of the project (another 6 turbines), which is being negotiated since nearly two years, is far from certain. At the level of municipal management, the Darling initiative also led to a major headache, albeit for a different reason. With a new Municipal Finance and Management Act (MFMA), every municipality was required to hold broad consultations with stakeholders for any project that would impact on a three year budgetary circle. Cape Town therefore embarked on a long and cumbersome 2-year effort to 'sell' the decision on the Darling PPA to various external parties.

Discussion: Dilemmas of a Pioneer

There is little doubt that Cape Town has been a trendsetter in sustainability. The city has been one of the first to commit to sustainability targets and developed the necessary policy visions to underpin such efforts. The municipality also worked towards the implementation of that vision, even though major bottlenecks persist in terms of regulatory authority and financial resources. While the institutional embedding of climate change and energy within the departmental setting of the city government should be considered a major step forward, political leadership at the top has thus far remained hesitant to actively pursue (and fund) a green-conscious growth agenda.

The problematic implementation of the power purchase scheme with Darling has led to a significant reluctance within municipal policy-circles to repeat similar experiments in the near future. Technical problems, contractual difficulties, financial constraints and the uneasy relationship between national and municipal initiatives have resulted in a higher risk-aversion among the ones responsible for Cape Town's future energy. This might only change when the national REFIT scheme comes underway.

Coming back to the academic discourse on renewable energy and green growth strategies, the Darling experience points towards an interesting observation. Within a context of a strong national regulatory framework, which is the case in many African countries, municipalities today still have limited options if they want to get actively involved in local renewable energy generation. This is particularly the case for longer-term policies that are aimed at stimulating private investment in renewable energy, be it on the corporate or household level. Yet, municipalities can play a key role in pushing ahead with pilot projects that are ahead of national policy developments. The case of the Darling wind farm shows that Cape Town city officials were able to pursue a vision of renewable energy generation despite non-existing policies on the national level. The value of this experience does not necessarily lie in its applicability elsewhere, but rather in its status as a pilot project, and as a catalyst for national efforts (see figure 8 below).

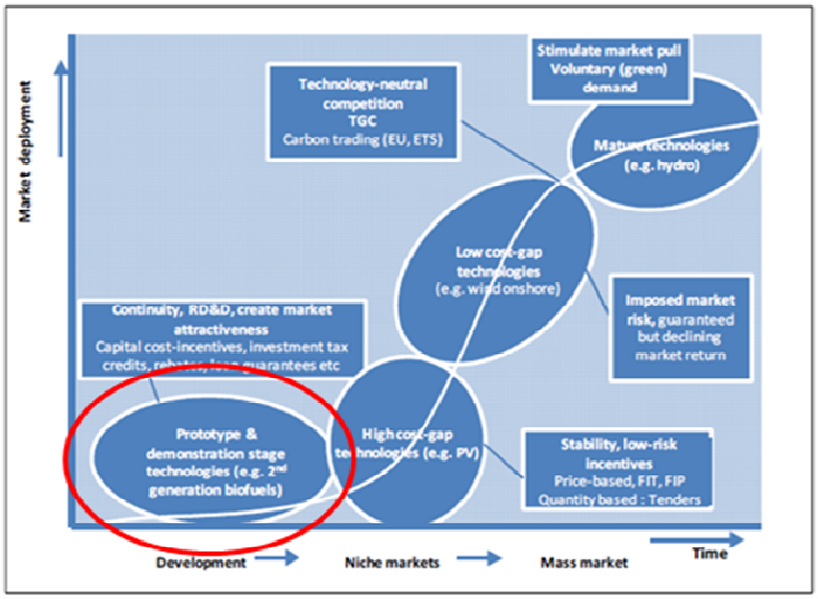

Figure 8: Cape Town's Darling experience can be placed at the lower left corner of the OECD framework for market development of renewable energies. Source: OECD (2010).

Looking forward, the national REFIT scheme can be expected to have a significant impact on renewable energy generation in the Western Cape. Many international investors have already teamed up with local companies to apply for power purchase agreements, and are all waiting for the regulatory framework to be in place. The number of wind farms, solar PV installations and solar thermal plants across the region are set to increase and generate renewable energy for the national grid.

Cape Town and other municipalities can then decide whether or not to get involved in these developments. While the three key bottlenecks regarding the institutional, financial and political context are likely to remain, the city can be expected to continue its green growth ambitions. In doing so, the most obvious green-conscious strategy to follow include self-governing (the purchasing of green electricity for own consumption or forward selling) and enabling local companies to participate in IPP schemes. The latter might be not only be an opportunity for Cape Town, but for the provincial government, i.e. through trade facilitation and the planned creation of so-called special purpose vehicles (SPVs) on green investments.

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Notes

[i] GlobalData 2009. The database is the property of University of Amsterdam.
[ii] Reuters, 28 December 2009. http://af.reuters.com/article/topNews/idAFJOE5BR04S20091228
[iii] Note: Whereas South Africa's renewable energy sector includes various major cities, in the remaining 29 countries one can find 85% of the locations in the economic capitals.
[iv] http://www.guardian.co.uk/environment/datablog/2009/sep/02/carbon-emissions-per-person-capita
[v] ADB Statistical Pocketbook 2010.
[vi] Website City of Cape Town http://www.capetown.gov.za/en/electricity/Pages/GreenElectricity.aspx accessed on 26 March 2010.
[vii] Website SAAEA http://saaea.blogspot.com/2009/12/green-electricity-certificates-cape.html
[viii] Website http://myza.co.za/politics/eskom-cant-be-player-referee-zuma/02/15/
[ix] Website Engineering News http://www.engineeringnews.co.za/article/power-purchase-agreements-are-being-prioritised---deputy-minister-2010-03-15/page:9
[x] NERSA media statement 31 March 2009.
[xi] The five energy visions include: 1) A city where all people have access to affordable, appropriate, safe and healthy energy services; 2) A leading African city in meeting its energy needs in a sustainable way, and thus fulfilling its constitutional and global obligations; 3) A city that uses and manages energy in an efficient way. This applies to both the City of Cape Town's operations as well as to residential, commercial, industrial and other sectors of the City; 4) A city with an efficient and equitable transport system, based on public transport and compact planning to enable all residents to enjoy the benefits of urban life in residential, commercial, industrial and other sectors of the City; and 5) A city where energy supports economic competitiveness and increases employment in residential, commercial, industrial and other sectors of the City.
[xii] The team is responsible for three 'work streams': energy security, adaptation and awareness.
[xiii] http://wind4africa.net/news/viewnews.php?ID=149
[xiv] In addition, Cape Town could only give this guarantee because of a coincidence. At the time, South Africa had experimented with regional electricity distributors (REDs), for which Cape Town acted as a pilot case. The head of this first RED supported the Darling initiative. Later, the RED experiment was cancelled and Cape Town came to bear the financial risk associated with Darling. Insiders argue that this Darling PPA would not have been signed without the RED support.
[xv] The fact that Eskom might be split into separate generation and transmission companies could potentially add more costs to the Darling wind farm project.
[xvi] When the anticipated supplier pulled out, the IPP looked for a different one. The selected replacement has a lower capacity and was a prototype, with uncertified blades. It was anticipated that a large contract with Brazil would co-finance the large-scale roll-out for this model. When the Brazilian contract was cancelled, the company decided not to further develop this type. As a result, the Darling models are the only ones world-wide and cannot be ordered for the second phase of the project.