Sustainable Energy Transitions: Changing the 'Business as Usual' Trajectory in Sub-Saharan African Urban Areas

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Abstract

This paper describes a novel approach to helping municipal authorities address the sustainable energy challenges associated with rapidly growing urban populations in Sub-Saharan Africa. Population in Africa is expected to double between 2010 and 2040, and substantial urban growth is expected in small and medium-sized cities where local government capacity constraints are most serious. A long-term partnership between municipal authorities, NGOs, and academics can build capacity, and a prescribed strategy can lead to progress on the ground. In order to contribute to future action, the paper argues for a greater role of local government in sustainable energy transitions, and presents some of the lessons learned from work in municipality-based energy work undertaken in South Africa over a 17-year period. It provides evidence of change, but more importantly, considers the process by which that change occurred and the intentional strategy of policy influence. Several South African cities engaged in this process with the assistance of the non-profit organization Sustainable Energy Africa have been able to move to greater renewable energy and energy efficiency implementation, and have strengthened their energy capacity and governance frameworks. The paper reviews the changing energy characteristics of South African cities, and describes the key processes that create a policy environment conducive to moving away from business as usual and responding to sustainable energy imperatives around clean energy and energy poverty. The use of energy modeling to support municipal energy strategy development is also described as an important informant for decision-makers regarding the consequences of decisions taken, or not taken, today. As such, it provides the groundwork for transferring the methodological process to other countries, while the latter part of the paper draws on recent experiences in Uganda and Ghana in replicating the work.

The Energy Challenges of African Urbanization

Population in Africa is expected to double between 2010 and 2040. The urban population proportion across sub-Saharan Africa is 38% (UN, 2014), but is growing steadily at 1.4% per year. Most urban development in Sub-Saharan Africa is occurring in a non-planned and non-transparent manner (African Research Institute, 2013), and well over half of urban dwellers live in slum conditions, which presents serious governance challenges. One of the noteworthy features of the

population growth in Sub-Saharan Africa is that it is expected to take place mostly in small and medium sized cities, rather than capitals (UN-Habitat, 2010). Yet this is where local government capacity is weakest, and there is little to suggest that urban governance capacity will improve significantly under 'business as usual' conditions, as reflected in a recent assessment of capacity in African local government: "few countries have developed strategies to cope with the challenges posed by rapid urbanization" (Cities Alliance & UCLGA, 2013, p. 10).

Energy is just one facet of sustainable urbanization, but a completely cross-cutting one, closely linked with welfare, economic health and environmental sustainability. However, as noted in the recent African Energy Outlook (IEA, 2014b), in spite of being resource-rich, access to modern energy in Sub-Saharan Africa remains low, the use of unsafe and unhealthy fuels is widespread, energy infrastructure is poorly developed, and the electricity supply is unreliable. While efforts to improve access to electricity are increasing, it is not keeping pace with population growth so the absolute number of people without a connection is rising. The often unreliable power systems have led to a proliferation of expensive back-up generators, and the ubiquitous reliance on solid biomass is putting forestry stocks under increasing pressure. The energy challenges in the region are therefore substantial, and there are roles for all levels of government in shaping a more sustainable future.

Over the past decades the understanding of a 'sustainable energy transition' has started to broaden from a focus on cleaner energy to include the democratization of energy. This involves a greater decentralization of energy systems, increased bottom-up decision-making, and a demand-driven planning focus, in contrast to the nationally centralized, supply-side planning common around the world before the 1990s (Goldthau, 2014; Reddy, 2002). A greater involvement of municipalities is a component of this trajectory, as reflected in the MDGs (Modi et al., 2006), where local government's role is specifically noted, and the Sustainable Energy for All (SE4All, 2014) initiative, where 'bottom up' solutions are considered important, amongst others is presented. The UN-Habitat notes, "Each region, nation, city and locality is different and sustainable innovations must be tailored to specificities that vary between localities and over time" (UN-Habitat, 2014, p. 7). This again suggests a stronger role for municipal government in energy transitions.

The Role of Municipalities in Sustainable Energy Transitions

Although not yet acknowledged by many national governments, municipalities need to be stronger players in supporting the sustainable energy transition. Their core role around urban planning, transport planning, electricity distribution, and building plan approvals, amongst others, are important factors in energy transitions. Buildings consume 32% of the world's energy (IEA, 2014a), and each inefficient building that is erected today commits its occupiers to upwards of 50 years of unnecessary energy consumption and associated high costs and emissions levels. Uncontrolled sprawling urban form results in cities that are likely to consume 30% or more transport fuels than denser cities (FFC, 2011). Municipalities are also significant consumers of energy in their operations, and operate landfill and wastewater treatment systems that can present

opportunities for clean energy generation. In addition, they can play a facilitative role for localized energy programs, such as the promotion of small-scale renewable energy systems (e.g. rooftop PV or biogas systems) and efficient cook stove initiatives (Kaza and Curtis, 2014). They are in close contact with their citizenry, including the growing urban poor population, and so are well placed to plan and respond more appropriately than national governments or other 'external' agents.

Sustainable Energy Transitions in Cities: The Case of South Africa

The 18 urban areas covered by the recent State of Energy in South African Cities Report (SEA, 2015) are home to half of South Africa's population, but occupy under 5% of the country's land area. They account for over a third (37%) of the national energy consumption and nearly half (46%) of national electricity consumption. They also consume half (52%) of the country's petrol and diesel. The city energy picture is thus crucial in moving the country along a sustainable energy trajectory. Yet, as with most local governments in developing countries, they are capacity constrained and struggle to provide the necessary services to their citizens, let alone give attention to issues which have longer-term consequences such as sustainable energy transitions. This is a dangerous situation, with the potential for a spiraling decline in welfare as the consequences of unsustainable practices steadily become the crises of the day.

Given the growing recognition of the role of local government in a sustainable future (ADB, 2011; Cities Alliance and UCLGA, 2013; & UN-Habitat, 2014;), support for this level of government has started to increase over the past years, with organizations such as the International Council for Local Environmental Initiatives (ICLEI) and the South African Local Government Association (SALGA) having a growing sustainable energy focus. The following sections describe a municipal support program run by the non-profit organization Sustainable Energy Africa since 1998 – the longest-standing of such support initiatives in South Africa. When this work started, cities were generally not regarded as players in the energy sector, and were not considered in most national energy policy or strategy discussions. Today, this has changed. Due in no small part to such support programs, cities are now regarded as central agents to a sustainable energy future for the country. For example, local governments now are instrumental in key national policies such as the National Climate Response White Paper and the National Energy Efficiency Action Plan, and have a recognized role in national electricity planning documents.

Agents of Change: An Applied Methodology for Facilitating Energy Transition at the Local Government Level.

The capacity shortfall of local government to tackle the challenges posed by sustainable energy imperatives are significant, and are likely to remain so into the long-term under current conditions, as noted earlier. Given this situation, there is a clear need for external capacity support, and recently international organizations have begun to respond to this need, as discussed above. However, efforts to support municipalities with sustainable energy initiatives are too often ineffective. A fundamental reason for this is because many such initiatives, often conceptualized by *outsiders*, lack a detailed grasp of the complex internal operations and dynamics of

municipalities and do not appreciate the severe constraints they operate under. Often, approaches to this issue are derived from experiences in northern cities, where capacity – human and financial - is far less of a challenge, mandates and priorities are significantly different, and there is substantially less political interference and manipulation than at the local level (Bawakyillenuo et al., 2015).

Sustainable Energy Africa has worked as a support organization for municipal authorities in South Africa over a 17-year period to promote sustainable energy. Over this time, they have developed a structured method of working with local government to support sustainable energy transitions. This methodology can be applicable to any organization in the role of change agent to this government sector, and is now being used in other African countries as indicated in the SAMSET (2013) project. The methodology is described in detail elsewhere (Bawakyillenuo et al., 2015), but in summary, there are two key elements involved: one is the presence of an intermediary organization and the other is the structured workstream.

Role of the Intermediary.

Key to the approach is the involvement of a local intermediary organization, which can fulfill a number of functions:

- Links several municipalities together in a partnership arrangement;
- Facilitates the development of a Sustainable Energy Strategy by municipal authorities;
- Coordinates local government inputs to relevant national activities;
- Identifies barriers and constraints to the successful implementation of projects;
- Provides a certain amount of expertise and research capability, but more importantly, has the contacts to be able to source specialist expertise as needed;
- Acts as a knowledge intermediary, making technical information accessible to partners;
- Promotes learning and capacity building of municipal partners, for example by running suitable workshops and courses.

The intermediary should be an established, respected institution that deals with urbanization and/or energy and has a grounding in applied research. Candidates include universities, NGOs, and professional associations. However, the complexion of the intermediary organization is important; for example, local government associations tend to be too political, and some university locations may be too academic.

Structured Workstream.

A structured program of the following activities is designed to identify priority issues, develop a strategy to address these, and act on the strategy:

1. **Developing a State of Energy Report** on each municipality – examine the energy supply and demand (domestic, commercial, industrial, transport, and government), including energy access and poverty, and environmental implications of energy use.
2. **Undertaking primary research** to fill information gaps evident from the State of Energy assessments.

3. **Modeling energy's future** using a simple energy modelling package, or even a spreadsheet. Considering energy use in the future based on, for example, population and economic growth trends can help decision makers identify forthcoming problems, and plan accordingly (discussed more later).
4. **Developing a Sustainable Energy Strategy** evolving from the previous activities that identifies areas to be pursued, and assigns responsibilities and timeframes.
5. **Implementation** support so the intermediary organization supports the process by facilitating, sourcing technical support, and communicating technical information to partners. This is arguably the most critical area of work of the program.

The structured workstream described above, and the work of the intermediary organization in particular, all serve to strengthen the capacity of municipal partners. Formal capacity building activities have also been found to be effective:

- Networking events - municipalities share lessons from implementation of particular projects.
- Week long 'Masters Level' courses – relevant not only to municipalities but also to academics, consultants, NGOs, and development workers.

Networking not only facilitates lessons sharing, but builds relationships between municipalities and enables the development of common positions resulting in a stronger voice to national government.

The Changing (or not) Energy Characteristics of South African Cities

Given the multiple factors that are inevitably at play in an ever-changing energy sector, what has the impact of such a dedicated local government support program been? The recent State of Energy in South African Cities 2015 report provides an overview of the changes that are taking place across the top cities in the country. Together with a range of other research reports, the emerging picture is one of significant local government energy governance shifts, substantial implementation in some sectors, and little movement, even deterioration, in others.

The Energy Picture.

South African cities are characterized by high transport fuel energy consumption, partly associated with sprawling cities with poor public transport. Electricity is the second largest energy source (Figure 1) supplying the residential, commercial, and much of the industrial energy needs. Depending on the industrial sector characteristics of a city, there may be significant coal or heavy furnace oil consumption in the energy profile. Electricity is accountable for the majority of global warming emissions due to the carbon-intensive nature of national electricity generation, which is mainly coal-based. Largely because of such electricity consumption but also because of their high transport energy use, South African cities are amongst the more carbon-intensive globally (SEA, 2015).

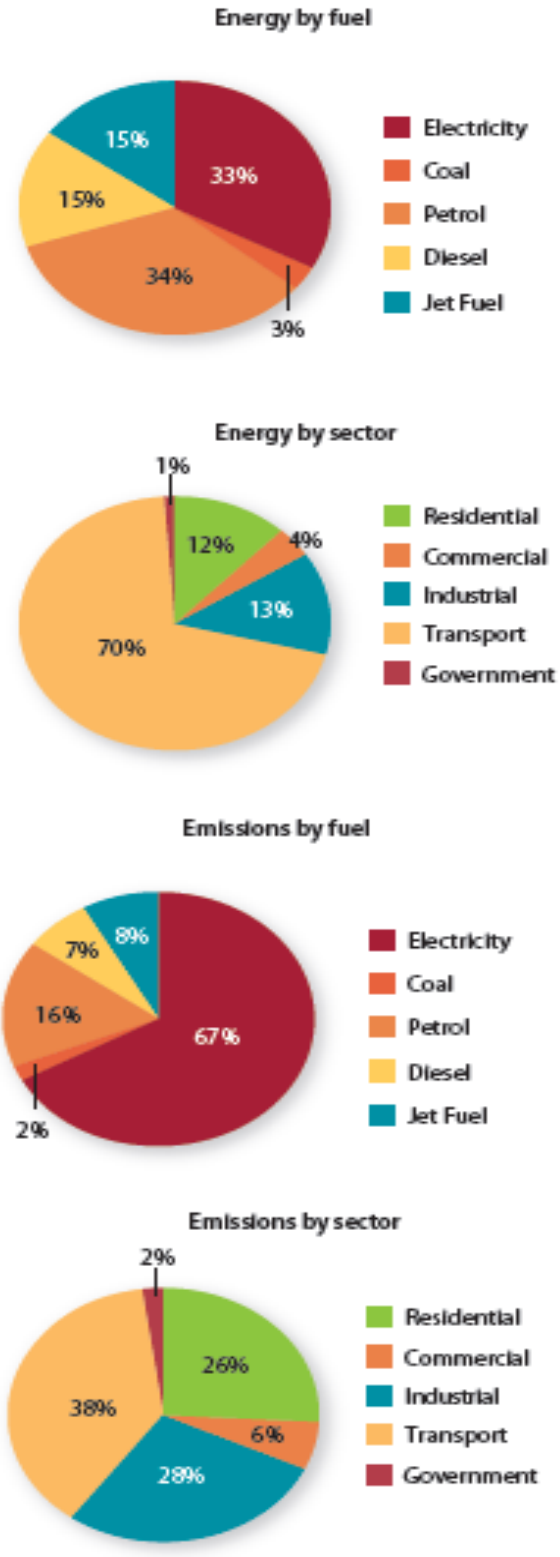
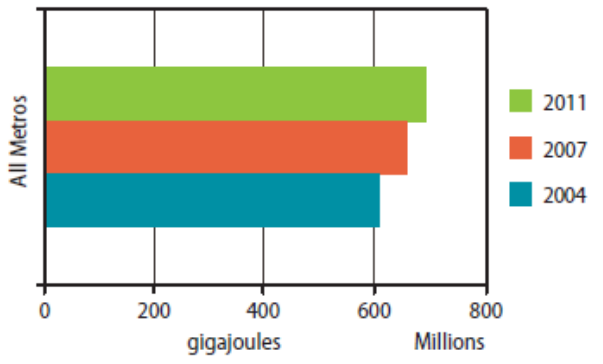


Figure 1: Typical metro energy use and carbon emissions (SEA 2015)

Key Urban Energy Trends.

Overall, energy use in South African cities has increased over the past decade, as expected in a developing country with a growing population and economy. This is substantially driven by transport fuel increases, since absolute electricity consumption has declined since 2007 (Figure 2 and 3) due to steep electricity price increases and to some extent the global recession. The economy in many urban areas is becoming less energy intensive, partly because some cities are showing a small shift away from manufacturing and industrial sectors towards the less energy-intensive financial and services sectors, but the decoupling is also thought to be a response to electricity price increases. This reduction in energy intensity is a positive trend, as the national economy has been notoriously energy intensive due to historically low electricity prices.



Note: excludes aviation and marine fuels

Figure 2: Energy consumption over time in South African metros (SEA 2015)

Significant progress has been made with electricity efficiency since 2007, both in the private sector as well as in municipal operations. Although this trend has been accelerated by the electricity price increases, the focus on efficiency strategies and action plans, awareness raising campaigns, private sector energy efficiency forums and pilot projects that preceded the price hikes is likely to have enabled a more effective response to the situation. Within municipalities, efficiency improvements in traffic lights, street lights and buildings has been significant, supported by a National Treasury Energy Efficiency and Demand-Side Management (EEDSM) grant, and this has precipitated the institutionalizing of electricity efficiency in local government operations in several cities. Another significant development in the field of energy efficiency is the finalization of national building regulations that specify minimum efficiency standards for all new buildings (SABS, 2011), although they are not yet being widely applied mainly due to capacity constraints amongst municipal staff. However, in spite of these positive steps, there still remain significant unexploited energy efficiency opportunities, as reflected in the National Energy Efficiency Action Plan (DoE, 2013) as well as a recent assessment of efficiency opportunities in municipal operations (SACN, 2014). Amongst these is lack of ceilings in the majority of the approximately 3 million government subsidized low income households, resulting in poor indoor comfort levels and higher space heating energy expenditures in winter.

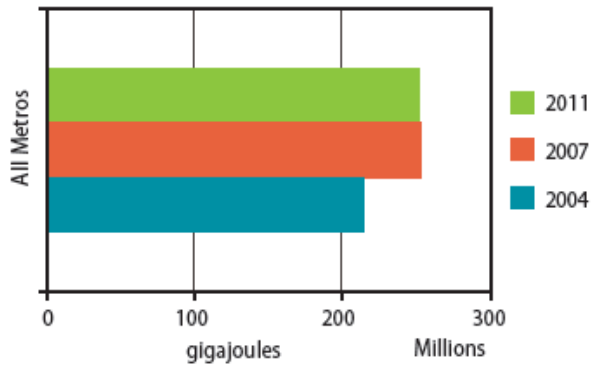


Figure 3: Electricity consumption over time in South African metros, showing the decrease after 2007 (SEA 2015)

The renewable energy profile of cities is improving (Figure 4) with several methane from landfill gas projects completed or underway and one significant wind generation project in place. In addition, sewage methane is being explored and rooftop solar PV embedded generation installation numbers are accelerating. Many municipalities have developed, or are in the process of developing, regulatory and procedural guidelines to accommodate this increased interest in embedded generation, as it is becoming ever more popular in light of consistently steep conventional power price increases and renewable energy technology price decreases. Total amounts of renewable generation, however, are still very small in relation to city purchases from the national power grid – less than 0.3% of the total (SEA, 2015).

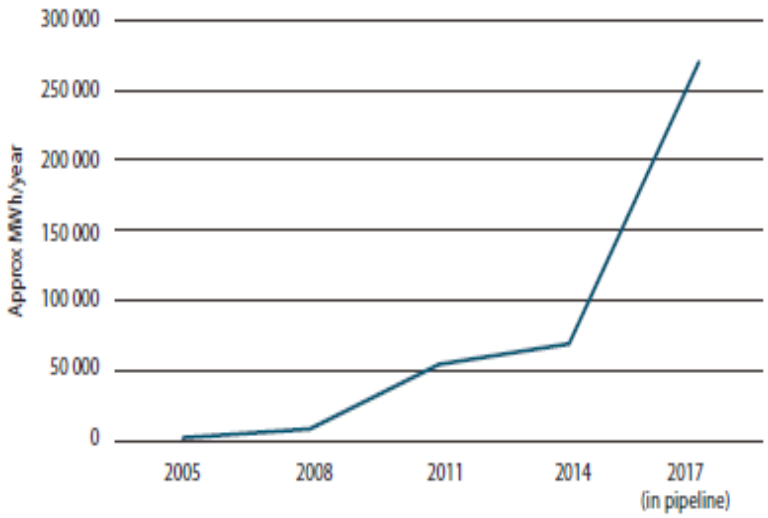


Figure 4: Municipal (led or assisted) renewable energy capacity (SEA 2015)

Access to electricity in South African cities is generally close to the national targets of 97% access by 2025, with 10 of the top 18 cities having connection rates of 90% or above, and only one being below 80% electrified (SEA, 2015). Several cities have programs to electrify informal settlements, often using innovative approaches and appropriate technologies to move into this previously marginalized sector (Gaunt et al., 2012).

Overall, carbon emissions from cities are decreasing per capita in terms of GVA despite increases nationally (Figure 5). This has to do with the shifting nature of industries in urban areas, but also the recent decrease in total electricity use. To a lesser extent renewable and other sustainable energy interventions have contributed to this trend (SEA, 2015).

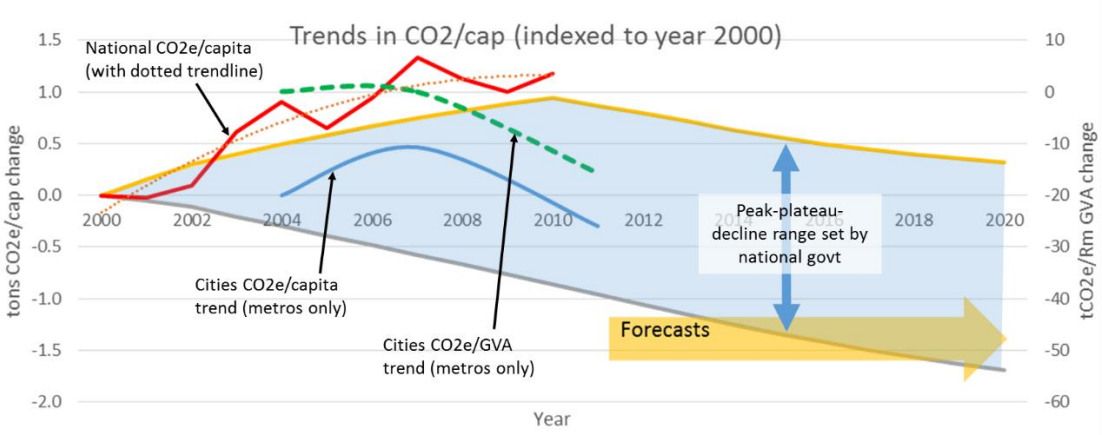


Figure 5: Metro carbon emissions trends compared with national (SEA 2015)

In the urban transport sector, there has been limited progress however. In spite of the Gautrain rapid rail project and Bus Rapid Transit (BRT) projects being implemented in several cities, the characteristic of urban transport is moving increasingly towards greater private vehicle dominance, worse congestion, greater real household expenditure on mobility, and longer commute times (DoT, 2013, DoT, 2014). Sustainable transport efforts are only likely to gain traction within a supportive spatial planning framework, however, and unfortunately, the development of South African cities has largely reinforced the apartheid spatial form of sprawling, low-density urban spaces, with the poor often in far-flung settlements, resulting in inefficient and expensive transport systems and reduced access to urban amenities by many households (CGTA, 2014). While a few urban areas have progressive spatial development frameworks or regulations, urban form changes slowly, so even in these instances, it is not yet conducive to significant shifts towards sustainable transport.

The State of South African Cities Report (SEA, 2015) indicates that urban energy-related governance has made substantial progress over the past decade, with seventeen metros and secondary cities developing sustainable energy strategies by 2011 from the first one in 2002 (SEA, 2013), and dedicated sustainable energy management capacity increasing exponentially. (In 2015, there were over 35 dedicated staff dealing with sustainable energy matters in four leading metros, which is an increase from zero in 2000.) In addition, the availability and collection of local-level data to enable planning and track progress has improved markedly since 2000, prompted by multiple data collection exercises (SEA, 2006; SEA, 2011; & SEA 2015). An overarching local government sustainable energy strategy has been developed by the South African Local Government Association (SALGA, 2014), and the engagement of many municipalities with substantial renewable energy and energy efficiency projects indicates a departure from business as usual practice. However, without external support, the fact remains that most municipalities struggle to attend to sustainability projects that have longer-term benefits because of the pressing demands of day-to-day service delivery.

Evidence of Impact from the Support Program

Urban change is driven by multiple factors, including energy prices, technology developments and prices, global warming pressures, national and local policy shifts, local political interference, resource discoveries, and economic performance and structural changes. In addition, in the past years, there have been several players active within the local government energy sector, partly linked to the increasing recognition of their crucial role in a sustainable energy transition and a resulting inflow of funding in this direction. It is therefore not easy to isolate the impact of any one support program such as the initiative described earlier, albeit a longstanding and extensive program. An independent review was undertaken in 2014 to this end which drew on interviews with stakeholders as well as a review of tangible projects linked to the program. In brief, the support given by the program was described as having a clear role in the following:

- initiating the development of nation-wide city energy data,
- facilitating energy efficiency programs in different sectors in several municipalities,
- promoting renewable energy (often rooftop solar PV) in several major cities,
- bringing local government perspectives to a range of key national policies and strategies,
- bringing energy and climate change issues into spatial planning for the first time, and
- institutionalizing sustainable energy and climate change issues within municipalities (CDRA, 2015).

In six metros, the institutionalizing of sustainable energy has progressed significantly with energy strategies being developed and staff compliments expanded significantly. Tangible change has been evident, because of a range of factors, of which the above support is seen by stakeholders as being amongst the significant ones. The support program facilitated a sharing of experience with successful projects through research support, inter-municipal exchanges, site visits and making technical expertise available. Implementation of the following has accelerated as a result:

- Installation of renewable energy capacity including electricity from landfill gas and waste water gas, rooftop solar PV, biowaste and wind electricity;
- Energy efficiency measures including street lighting, traffic lighting, and buildings efficiency.

Municipalities are generally conservative by nature and follow more readily than lead, so effort invested in supporting the first municipalities generally has a multiplier effect, especially when successes are shared via facilitated learning exchange events.

Making a Support Program Work in Practice

The experience from the last 17 years of working with municipalities has given insight into a number of important principles for local government support programs. The approach needs to be flexible enough to accommodate the following key operating principles:

- Because municipalities are by nature conservative, it is most effective to work primarily with proactive partner municipalities, from which lessons can radiate to others. Selected partner municipalities should be fast growing, have senior-level buy-in to the program, and above all, they should be enthusiastic to participate.

- ‘Outsiders’ cannot easily grasp the detailed inner dynamics of municipalities, which are very often bureaucratically complicated as well as being subject to idiosyncrasies associated with politics and power. It is, therefore, essential that the sustainable energy strategy is led by the municipalities with the intermediary organization fulfilling facilitation and support roles.
- It is important to make sure that the programs focused on are compatible with political interests and strategic priorities; it may be appropriate to focus on specific sectors where there is the most interest and alignment with municipal goals.
- Success depends on goodwill within the municipalities, so the program should support the interests of key staff, even if this may not address highest priority energy issues, especially at the early stages of working with municipalities. Once the benefits of the program are appreciated, focus can shift more towards energy priorities.
- It is worth linking with the ‘champions’ within a municipality who are keen to see change. Because change requires effort, little happens without people who have a specific motivation and vision in this area.

It is important to emphasize that this is a long-term approach. In the absence of any clear revenue streams, the support program will require external funding. Few local governments in South Africa or Africa are likely to have the capacity, even in the long-term, to give adequate attention to future sustainability concerns in the face of the more immediate service backlogs and other urgent pressures. Supporting the capacity of local government can be funded by national governments but comes with a risk of bringing national political interests to bear, which may not be in the best interest of local government. Funding from development support donors is thus more appropriate.

Energy Futures Modeling to Support Municipal Prioritization and Planning

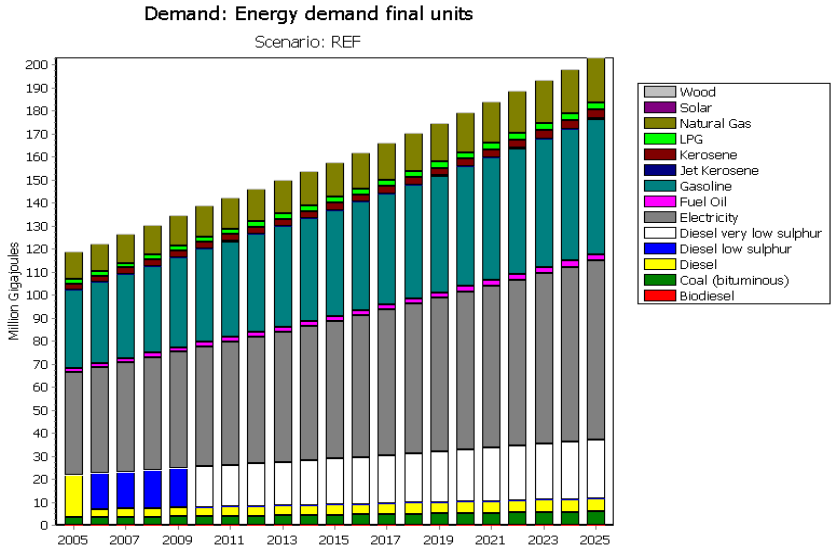


Figure 6: Modeled energy consumption forecasts under Business-as-usual (Ekurhuleni)

Although just one of a suite of support activities, energy futures modeling has played a significant role in the support of South African cities. As part of their energy strategy development process, full-system energy modeling has been undertaken in five cities - Thekwini, Ekurhuleni, Cape Town, Buffalo City and Polokwane. A province-level model has been developed for Gauteng, and

partial models have been developed in several other cities. Modeling the future has been found to be an important motivator for change. If decision-makers can see the future impact of decisions taken, or not taken, today, they are more likely to be proactive in this regard.

The accuracy of such modeling exercises is reliant on adequate data. While local-level data is improving, it is still far from comprehensive or reliable (SEA, 2015). However, a decade of experience with modeling (Winkler et al., 2005) shows that, even with substantially less-than-complete data sets, it is a worthwhile exercise, because for strategy development purposes in a municipality, a high degree of accuracy is not important. It is enough to demonstrate the broad implications of current trajectories and different intervention choices. The futures modeling is based on a 'business-as-usual' scenario, which is generally taken to be an expected future should current trends continue (See Figure 6 as an example.). Different municipalities will customize alternative, more sustainable scenarios based on existing policy frameworks and emerging priority issues. For example, if decision-makers can see the cost of a future 'business as usual' energy profile (e.g. Figure 7) and the potential cost savings of a different trajectory (e.g. Figure 9), they are more motivated to change the trajectory. In addition, the modeling can show which interventions are most critical to effect such change (Figure 8). Municipal officials are thus equipped with facts and figures to help argue the case for change and negotiate the inevitable political and bureaucratic inertia.

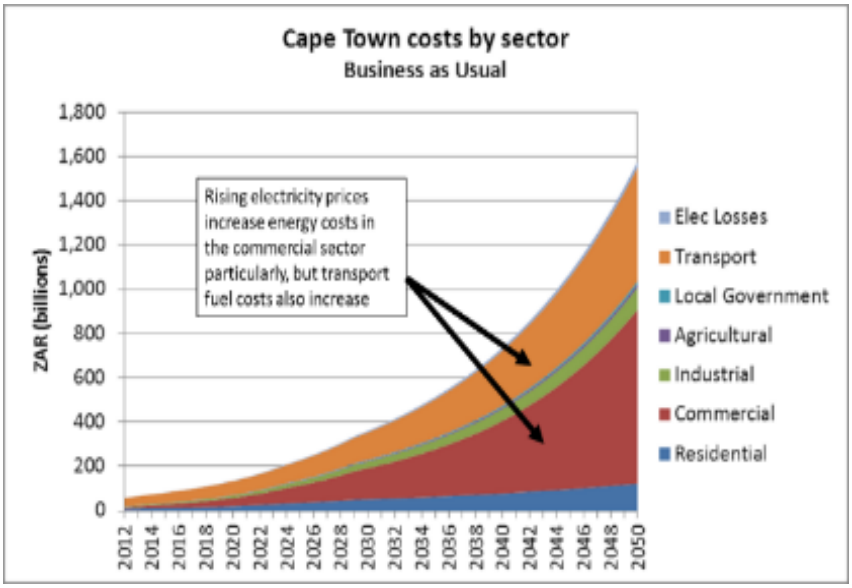


Figure 7: With energy cost increases and high growth, the city may face an expensive energy future (Cape Town)

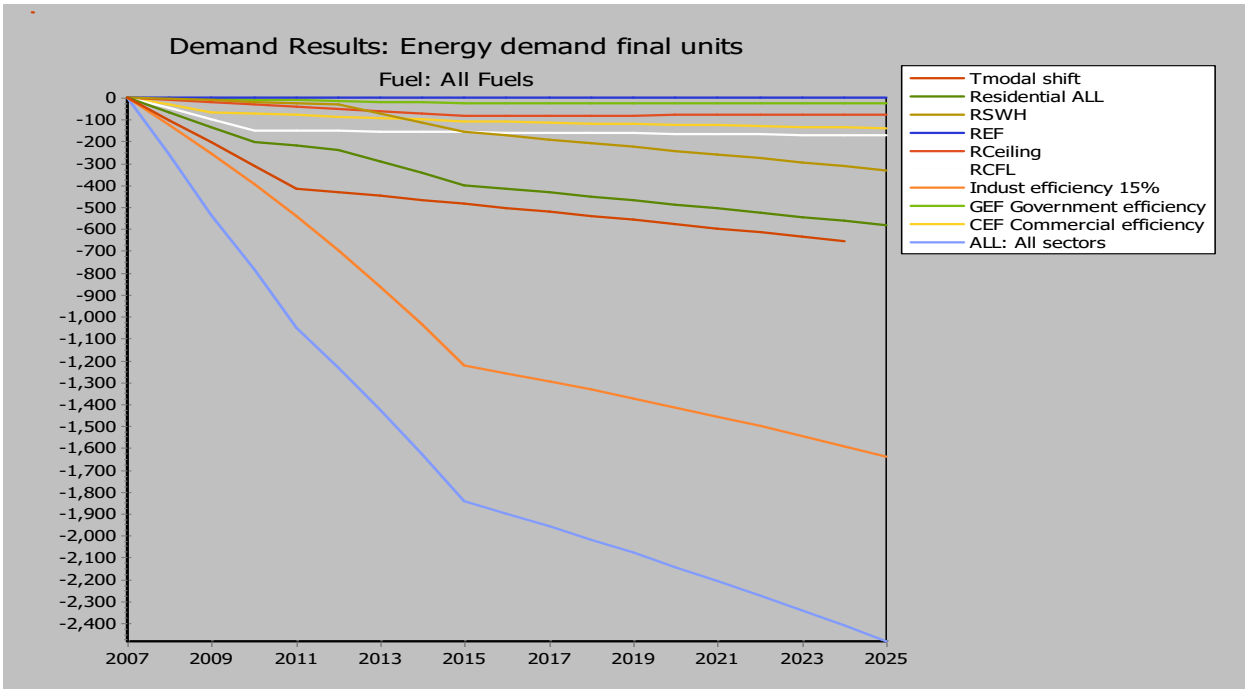


Figure 8: Energy saving impacts of different sustainable energy efficiency interventions (Buffalo City)

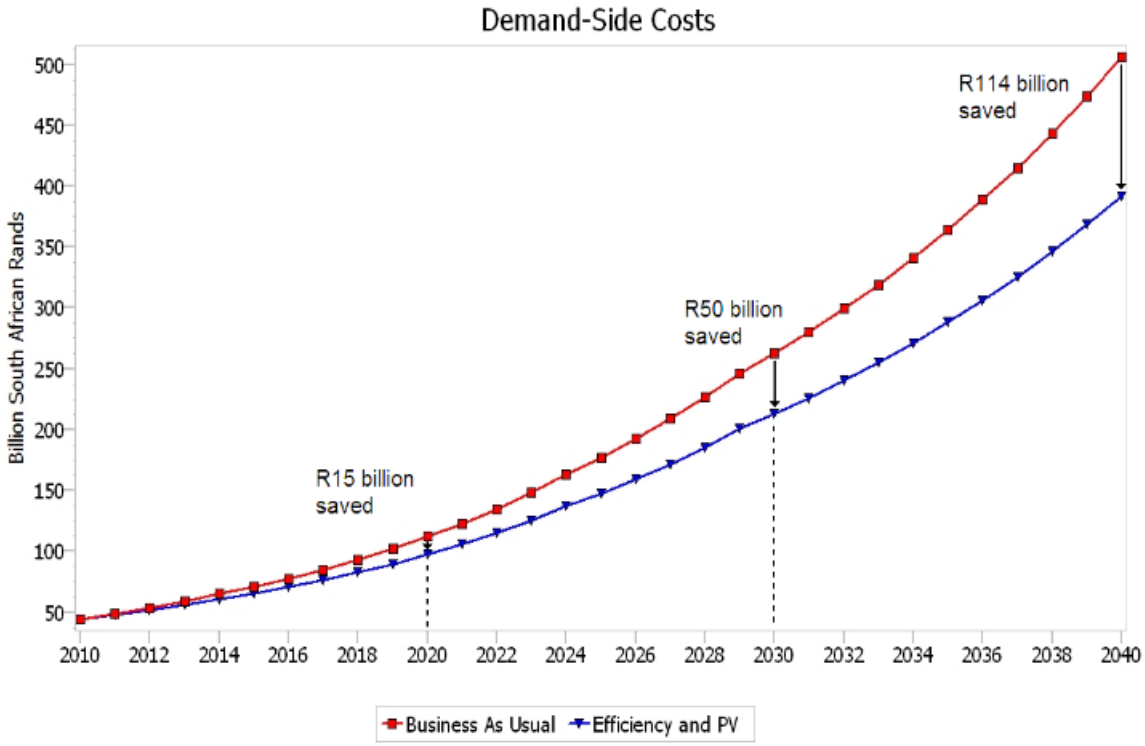


Figure 9: Modeled cost savings from efficiency and renewable interventions (eThekwini)

The modeling can also explore what is required to move a city's carbon profile to one in keeping with national or global mitigation ambitions. In South Africa's case this is the peak-plateau-decline trajectory defined in the National Climate Change Response White Paper (DEA, 2011). Through such an exercise, it is common to find that, even with a very ambitious set of efficiency and renewable energy interventions, the carbon trajectory can only temporarily accord with these ambitions (Figure 10), and in the decades to come, will start to depart from acceptable levels unless more fundamental and hitherto undefined shifts in the energy sector emerge. The difficulty of achieving a stable, declining carbon trajectory in the long-term is a concern the world over, one which is mirrored in South African cities.

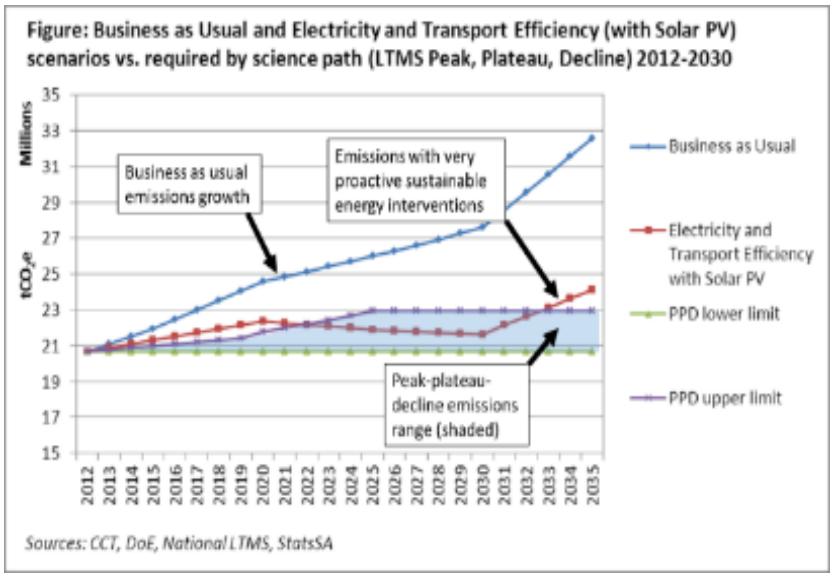


Figure 10: Even with significant sustainable energy implementation, emissions rise above acceptable levels after about 2035 (Cape Town)

Although energy futures modeling is an important part of strategy development and the local government support process, it must be seen as just one component of a general support framework, and should be adequately embedded in such a process if it is to be of use. Elements of the support program design mentioned earlier, including capacity building, participatory strategy development and a strong implementation support component, are essential if change is to take place.

Supporting Sub-Saharan African Cities with Sustainable Energy

Urbanization rates in Africa are amongst the highest in the world, and, as with South Africa, the municipal capacity to undertake even minimum levels of urban planning and basic service delivery is severely inadequate. This is acknowledged by institutions such as the African Development Bank (ADB, 2011), UN-Habitat (2014) and Cities Alliance (Cities Alliance & UCLGA, 2013); all of whom have noted the need for bolstering local government mandates, capacity and resources. This includes the municipal role in sustainable energy transitions given the

central role energy plays in welfare improvements and economic health, as well as its environmental impact. In many African countries, the capacity challenges are even greater than those faced by South African municipalities.

In general, although few outside of South Africa are electricity distributors, local governments across Sub-Saharan Africa have strong roles in spatial and transport planning and building plan approval. They also often manage solid and liquid waste streams, with associated renewable energy opportunities. All of these have important direct links with sustainable energy.

Drawing on the experience in South Africa, the SAMSET project (SAMSET, 2013) has been working with selected Sub-Saharan African municipalities at a detailed level since 2013. The project is a partnership with universities and development organizations in Africa and the UK, and six municipalities in Uganda, Ghana and South Africa. The project has identified intermediary support organizations in each African country – one at the Institute of Statistical Social and Economic Research at the University of Ghana, and one in the Faculty of the Built Environment at the Uganda Martyrs University, in addition to Sustainable Energy Africa in South Africa. The project is building the capacity of these organizations through their engagement with the structured workstream described earlier, and they are in turn supporting local partner municipalities with energy issues of relevance.

A central component of the project is to research and improve the knowledge exchange process (Marvin & Silver, 2014), both amongst the project partners as feedback to improve activity effectiveness, as well as more generally between local government and support organization players – those aiming to be change agents to this sphere of government. Given the current frequent misalignment of development support initiatives and local government needs discussed earlier, the knowledge exchange framework being developed is seen as a core contribution to such development support in Africa.

The municipal support work of SAMSET is in its early stages still and therefore impacts and lessons are not yet apparent. To date, 'state of energy' surveys have been undertaken to establish the problems and opportunities within municipalities, relationships with municipalities have been formalized, capacity building events have been held, and coordination with key stakeholders pursued. Energy futures modeling is in advanced stages and strategy development work has started. The inter-municipal knowledge exchange events that have taken place to date have revealed numerous transferrable learnings between the countries. This collaboration will guide the full process of systemic change with the municipalities over the coming years, and the longer-term plan is to roll out the approach and for the current intermediary support organizations in each country, to capacitate further intermediary organizations in other African countries.

Conclusion

Given the rate of urbanization in Sub-Saharan Africa and the lack of capacity in most governments to respond to the expanding service delivery needs, the region may be facing a crisis of global proportion. In Africa, there is a call for at least a partial localization of solutions. In addition, there is a growing recognition of the potentially important role of municipalities in

addressing the many challenges facing urban areas, including those associated with sustainable energy transitions. This, coupled with the severe capacity shortages in municipalities, point to an important focus for development support. The program described herein has had a positive impact on the trajectory of South African urban areas and can make a contribution in bolstering municipal abilities throughout Sub-Saharan Africa to respond to these challenges. It seems appropriate that such approaches are given greater attention by development support institutions globally.

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