

PAPER TITLE: Supporting African Municipalities in Sustainable Energy Transitions

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Abstract: "Supporting African Municipalities in Sustainable Energy Transitions" (SAMSET) is a project that seeks to develop a knowledge exchange framework for supporting local and national bodies involved in municipal energy planning in the effective transition to sustainable energy use in urban areas. Through close partnering with six cities in three African countries (Ghana, Uganda and South Africa), the project aims to develop an information base from which to support cities, undertake direct support for cities around strategy development and priority initiatives, and facilitate knowledge exchange and capacity building. This paper presents the experience so far (18 months), focusing on the challenges of collecting localised energy data, distinguishing it from National statistics, and modelling the local urban situations in sufficient detail for municipal authorities to make strategic decisions about energy transitions. It also outlines Netmapping work with local stakeholders showing how local agencies relate to each other and which institutions become brokers for knowledge flow.

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1 Background

The latest UN-HABITAT report on the State of African Cities¹ points to the familiar but serious problems associated with urbanization in Africa: Population in Africa is expected to double between 2010 and 2040, associated urbanization rates are the highest in the world, yet the capacity to meet planning and service delivery challenges in urban areas is severely inadequate. The situation is exacerbated in that most urbanization is expected in small and medium-sized cities, where local government capacity shortages are most serious². Well over half of urban dwellers live in slum conditions in Sub-Saharan Africa, and this sector of the population is anticipated to increase in the face of local and national government service delivery capacity shortages. In spite of the sometimes positive rhetoric, the African economy has not grown as hoped and urbanization has not been matched by industrialization, which is the reverse of what took place in many developed countries. GDP per capita has performed poorly and the formal economy only employs a small fraction of the labour force³. In this context developed country models of governance break down and concerns emerge around the revenue-base for governments, including municipalities, and the future welfare of the citizenry. In addition the negative impacts of climate change are being felt, with worse expected, further exacerbating an already complex set of challenges at the local level. Because of an historical bias towards rural concerns, and even active aversion to cities in the decades after independence in many African countries, to this day ‘few countries have developed strategies to cope with the challenges posed by rapid urbanization’⁴.

Given this situation, Sub-Saharan Africa is facing a problem the extent of which is likely to reverberate globally. UN-habitat has said that governments must regain control of their cities’ development⁵. But how is this to be done given the severe capacity constraints that exist? While the importance of developing decentralized capacity is emphasised in various publications⁶ and officially recognized by the United Cities and Local Governments of Africa (UCLGA)⁷, overall there is little that convincingly suggests that urban governance capacity will improve significantly, even in the long-term.

1.1 The role of municipalities in sustainable energy transitions

Energy is just one facet of sustainable urbanization, but a completely cross-cutting one, closely linked with welfare, economic health and environmental sustainability. 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 1990s⁸. A greater involvement of municipalities seems

¹ UN-Habitat. The State of African Cities 2014. Re-imagining sustainable urban transitions.

² UN-Habitat. African Population to Triple. UN-Habitat Press Release, November 2010.

³ Parnell S, Pieterse E (Eds) 2014. Africa’s Urban Revolution. UCT Press, Cape Town.

⁴ Cities Alliance and UCLGA, 2013. Assessing the Institutional Environment of Local Governments in Africa. The Cities Alliance and United Cities and Local Governments of Africa. September 2013 (p10).

⁵ UN-Habitat. African Population to Triple. UN-Habitat Press Release, November 2010.

⁶ Cities Alliance and UCLGA, 2013. Assessing the Institutional Environment of Local Governments in Africa. The Cities Alliance and United Cities and Local Governments of Africa. September 2013 (p10); Urban Development Strategy of the African Development Bank, 2011.

⁷ UCLG Africa 2007. Governance, Advocacy & Decentralised Development Programme for Africa (GADDEPA). United Cities and Local Governments of Africa, September 2007.

⁸ See Goldthau A 2014. Rethinking the governance of energy infrastructure: Scale, decentralization and polycentrism. Energy Research & Social Science 1 (2014) 134–140; and Reddy A K N, 2002. The new paradigm for energy. Current Science. Vol 82, No 3, Feb 2002.

inevitable in this trajectory, as reflected in the MDGs⁹ (where local government's role is specifically noted), and SE4All¹⁰ initiative (where 'bottom up' solutions are considered important), amongst others.

Municipalities can and should be central players in supporting the sustainable energy transition in their areas of jurisdiction. Their core role around urban planning, transport planning, and building plan approvals, amongst others, are important factors in energy transitions. Buildings consume 32% of the world's energy¹¹, 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 more dense cities¹². Municipalities are also significant consumers of energy in their operations, and operate landfill and wastewater treatment systems which can present opportunities for clean energy generation. In addition they can play a facilitative role for localized energy programmes, such as the promotion of small-scale renewable energy systems (e.g. rooftop PV or biogas systems) and efficient cookstove initiatives¹³. 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. 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."¹⁴ This again points to a stronger role for municipal government in energy transitions.

The acknowledgement that municipal government holds one of the key roles in energy transitions, although not yet internalized by many national governments, is not a new idea and is reflected in some of the major international initiatives as noted 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 under¹⁵. Municipalities often struggle to implement even the best ideas:

The challenge is to take these ideas and let them take root and gain life in the messy engine rooms of cities where the aircon may have been broken for many months, the average qualification basic, the engineer gone and the finance officer unwilling to do anything new. It may take 3 months just to appoint a staff member; up to six months to issue a tender and appoint a contractor. I have heard of instances where money for retrofit of public lighting ended up paying staff salaries; and funds for solar water heating installation could not be spent as there was no engineer to sign off that the houses could structurally bear the load.¹⁶

⁹ Modi V, McDade S, Lallemand D, Saghir J, 2006. Energy and the Millenium Development Goals. New York: Energy Sector management Assistance Programme, United Nations Development Programme, UN Millenium Project, and World Bank.

¹⁰ <http://www.se4all.org/hubs/african-hub/>

¹¹ IEA 2014. World Energy Outlook 2014. International Energy Agency. Paris, France.

¹² PDG 2011. The Economic and Fiscal Costs of Inefficient Land Use Patterns in South Africa, for the Financial and Fiscal Commission. Palmer Development Group, Stephen Berrisford Consulting, and African Centre for Cities. Cape Town.

¹³ Kaza N and Curtis M P, 2014. The Land Use Energy Connection. Journal of Planning Literature. 2014, Vol. 29(4) 355-369

¹⁴ UN-Habitat. The State of African Cities 2014. Re-imagining sustainable urban transitions. (p7)

¹⁵ Often approaches to this issue derive from experience in northern cities, where capacity – human and financial - is far less of a challenge, and there is substantially less political interference and manipulation at the local level.

¹⁶ Euston-Brown E, 2014. The Challenges of Low Carbon Urban Development.

<http://samsetproject.wordpress.com/2014/03/18/the-challenges-of-low-carbon-urban-development/>

The municipal picture is typically not one of competent, adequately resourced institutions. The lack of detailed understanding of the municipal context is a serious issue whose importance cannot be overemphasized, and underpins the lack of success of too many well-intentioned initiatives.

However, this rather bleak picture should not overshadow the great potential that harnessing municipal institutions promises. Amongst many municipal officials there is enormous commitment to their job in a challenging environment, and a culture of ‘doing’, which is generally absent from other levels of government. In short, they are a key institutional force that has to be harnessed in improving the future for urban Africans.

1.2 An effective local approach

This paper presents a programmatic methodology which we believe can have an important role in supporting municipalities to meet the sustainable energy transition challenges they face. It has been developed and refined in South Africa over the past 16 years¹⁷, and has more recently been extended to two other countries in Sub-Saharan Africa –Ghana and Uganda - with a view to adapting and refining it to be more widely applicable throughout the Sub-Saharan region¹⁸.

The methodology arises primarily from the experience of experts in the fields of sustainable energy, urban governance and capacity building who have supported municipalities with sustainable energy challenges over many years.

It is fundamentally about doing. It maintains that an adequately thorough understanding only really comes from walking the road of implementation. Preconceived frameworks not based on a detailed knowledge of the operating environments and constraints of municipalities are ultimately not helpful. While the methodology is unlikely to be a savior for the current urbanization and sustainable energy crisis facing Africa, it could be a significant contributor to improving the situation if key aspects of the approach are adopted more widely. In the same way that there is a call for Africa to find her own solutions to economic and social dilemmas because the models remaining from the colonial era are not serving her well, a localizing of urban energy solutions may be promoted by devolving capacity support to a municipal-level.

A programme based on this methodology will generally need funding for several years, often from a donor agency. It may be unusual to advocate a programme which has no clear ‘sustainability plan’ or ‘exit strategy’, however the likelihood is that African municipalities will need support into the longer-term: there are no convincing signs that they will become self-supporting in the face of these challenges of unprecedented scale, which threaten spiraling welfare declines with global repercussions. New approaches anywhere in the world commonly require resources to build the necessary capacity, and Africa often does not have the necessary resources for what is being asked of her. International funding is not the only way such a programme can be initiated - for example it could also be funded by national government. This would come with its own agendas, however, which, in Sub-Saharan Africa, are not always aligned with the best interests of urban areas. External funding such as from ODA programmes allow a certain flexibility and a true localization of approaches.

¹⁷ Borchers M, Euston-Brown M, Mahomed L 2008. Energy Planning in South African Cities, in Urban Energy Transitions edited by Droege P, Elsevier, Newcastle, Australia.

¹⁸ Called the SAMSET Project (Supporting Sub-Saharan African Municipalities with Sustainable Energy Transitions), 2013-2017. Funded by DFID, EPSRC and DECC. For more information visit: [http://www.samsetproject.site11.com./](http://www.samsetproject.site11.com/)

2 Overview of the methodology

Important components of the methodology are listed below, and discussed in more detail in subsequent sections:

- Linking an intermediary organization with one or more municipalities in a partnership arrangement, thus providing the municipality with additional capacity in a new area, and aligning the intermediaries work with municipal needs
- Engaging in a structured workstream which develops mutual understanding of energy issues between the municipality and intermediary, builds a trusting relationship between these parties, and develops a shared vision and action plan starting with their local priorities
- Implementation support by the intermediary to reveal the detailed constraints and demands of implementing projects and to make implementation progress (this component is at the heart of the methodology) – this may start with pilot projects to demonstrate and test new approaches
- Capacity building through shared learning events and formal courses
- Networking to build a common municipal position and voice, enabling more effective approaches to national government and other key local, national or regional players

The methodology can be flexibly structured when operationalised into a programme: it can be single or multi-country, and can include different intermediaries, municipalities, and specialist support, depending on the organisational capacities and preferences of the participants.

2.1 Fundamentally developmental

The methodology strongly embodies a developmental approach. It can be seen as a middle way between the two extreme approaches to development support: (1) ‘jet in the experts’ – where specialists are brought in from developed countries for long or short periods (typically from the country of the aid organization so that development aid partially recycles back to the donor country economy), and (2) ‘hand over the money’ – where funds are transferred to local capacity-strapped organisations in developing countries without the necessary support to enable adequate performance in what is often a new area of operation. While these two extremes may even be appropriate in some circumstances, our experience is that they are unfortunately too commonly inappropriately applied even to this day.

The applied methodology presented here brings resources to local developing country organisations, but within a framework where necessary external support is available without any external party actually ‘doing the work’. This approach is considered critically important, as it builds local capacity rather than undermining it as can happen with the presence of foreign experts. In addition the programme of work is incremental: it builds capacity, relationships and mutual understanding amongst key local organisations, including municipalities and research institutions, over a few years. It works with emerging opportunities, rather than calling for a complete overhaul of existing systems. The latter is not helpful to municipal officials who have to ‘keep the show on the road’ on a day-to-day basis. The more technical support provided may come from a donor country, but our experience is that it is more likely to be effective if it is from a developing country engaging with similar issues (as is the case with the SAMSET project where the main support is from South Africa, which has been developing and refining such a process for over a decade¹⁹, in addition to support from the funder-country – the UK).

¹⁹ This original programme where this methodology was first explored was a South African initiative called the Sustainable Energy and Environment for Development programme (SEED). It was largely funded by DANIDA with the British High Commission and REEEP also providing support.

3 Components of the methodology

The components of the methodology described below are considered to form a complimentary set, and ideally would all be included in a programme. However flexibility to suit local circumstances is important, and therefore a prudent set of mutually-supportive activities could also be selected in particular situations.

3.1 A key local intermediary

A local intermediary needs to be selected that is to coordinate national activities and partner with the municipalities in this programme. This should be an established, respected institution, such as a university institute that deals with urbanization and/or energy with a largely applied research approach, or an established NGO, for example. The political obligations and operational constraints of bodies such as local government associations would typically render them less effective in this role. If a university institute, it is important that it is prepared to step more into the 'applied' world than many academic research institutions habitually do. But it is not uncommon for them to do so, as witnessed by the involvement of Uganda Martyrs University and other academic institutions in the programme *Promoting Energy Efficiency in Buildings in East Africa*²⁰. By doing so the alignment of the 'knowledge generators' and the 'knowledge recipients' is substantially improved, and the relevance of the institution to a serious, continent-wide problem is enhanced.

3.2 Municipal-intermediary partnership

A partnership between the intermediary and at least two municipalities needs to be established. Municipalities selected should be fast growing, preferably reasonably proactive, and have senior-level buy-in to the partnership, but above all they should be enthusiastic to participate. To ensure senior buy-in the signing of a formal partnering MoU is advisable. While municipalities may have pre-existing energy issues they would like addressed, such clarity is not necessary, and in fact often not useful, as the structured workstream of the programme will clarify priorities based on a diligent analysis of the situation, the likely future, and the 'sphere of influence' or mandate of the municipality. Municipalities selected should ideally cover both the large cities as well as the smaller and mid-sized cities of below 1 million population. The large cities are often more able to find the necessary resources to break new ground, thereby setting a precedent for others, while the smaller cities need to be prioritized because this is where most urban growth is anticipated, and where municipal capacity is generally wholly inadequate compared with the challenges arising from rapid urbanization.

The other, less dynamic municipalities not in the partnership are also not completely left out. They are drawn in through the networking activities described later. Our experience indicates that once the more pioneering municipalities have some achievements to demonstrate, other municipalities follow that much more easily. Municipalities, possibly like all spheres of government, are generally conservative by nature, and follow more readily than lead, having the security that the technical, legal and financial issues are workable in this new territory.

3.3 Engage in a structured workstream

By engaging in a structured, incremental workstream together with the partner municipality, a shared understanding of the situation emerges, and the ground for developing a strategy to address some of the issues is laid. Such work also has the important function of building a trusting relationship between the parties, and demonstrating the use of the programme to the municipal partners. This is important, because municipal officials are often under-capacitated to meet the demands placed on them, so often will only continue to use their scarce time to engage with the programme if it is of clear value.

²⁰ <http://www.un-energy.org/activities/208-promoting-energy-efficiency-in-buildings-in-east-africa>

The work areas found useful include:

- **Developing a State of Energy Report** on each municipality: this helps establish the situation regarding energy supply and demand, including energy access and poverty, energy for economic activity, and environmental implications of energy use. It identifies the problems and opportunities relating to energy use, and also clarifies the information gaps.
- **Undertaking primary research** to fill information gaps: based on the findings of the State of Energy Report, research may be undertaken to fill data or other information gaps to enable a more complete understanding of the situation. This may involve questionnaire surveys, traffic counts or interviews with suppliers or energy users. As a rule, data at a local level is very poorly developed and thus some such research will almost always be necessary. However this should initially be 'strategic research' rather than attempting to gather comprehensive data with high statistical confidence level. Such thoroughness is not necessary to identify areas of implementation focus. The more comprehensive research can be done at a later stage, but a focus on strategic research is initially advisable otherwise the programme may stall here for some time.
- **Undertaking energy futures modeling:** by using a simple energy modelling package²¹, or even a spreadsheet, energy use into the future may be estimated based on, for example, population and economic growth trends. Alternative futures can also be explored in the exercise, such as the impact of increased public transport provision, more efficient building design, improved charcoal cookstoves, or extended electrification of households. This exercise has been shown to be important in that it enables decision-makers to see the future implications of different trajectories, illustrating forthcoming problems for which solutions need to be set in motion today.
- **Developing a Sustainable Energy Strategy:** Such a strategy, which could also be in the form of an Action Plan if preferred by the municipality, draws on the above work to indicate priority areas to be pursued, ideally assigning responsibilities and timeframes. Such a strategy establishes a mutually agreed intention, and is thus the start of aligning resources towards stated goals. It is critical that the intermediary institution only acts as a facilitator here, and that the strategy or action plan is developed by municipal staff themselves. Since municipal capacities and involvement will differ, it may be appropriate to focus on specific sectors where there is most interest and alignment with municipal goals, and deal with other sectors at another time as appropriate. For example, if the Spatial Planning department is actively participating in the programme but other departments are not, then a strategy which deals more with spatial and land-use issues impacting on sustainable energy transitions may be the focus initially.
- **Implementation support:** This is arguably the most critical area of work of the programme as this is where the real learning around the operational and capacity constraints of the municipality emerge, and is dealt with separately below.

The funds for the above work can either come from a central coffer if the programme has specific funding, or this work can be undertaken by a university institute as part of an ongoing research programme which aligns the research of undergraduate and postgraduate students to these ends, for example. It is preferable that the work areas are undertaken in a linked process rather than as discrete items because of the common understanding and relationship building process that is fostered as a result.

²¹ The LEAP package (Long-Range Energy Alternatives Planning) has been found to be appropriate here, being well established and supported, free to academic, government and NGO users, and relatively straightforward to use. For an assessment of different modeling options, see: Tait L, McCall B, Stone A, 2014. *Energy Futures Modelling for African Cities: Selecting a Modelling tool for the SAMSET project*. Energy Research Centre, University of Cape Town.

3.4 Supporting the implementation of the Sustainable Energy Strategy

To establish a strategy or action plan is easy. To implement items therein which have not been done within a municipality before is seldom easy. Therefore there can be no ‘resting on laurels’ once the strategy is in place, as the real work is still coming. To illustrate: In a South African municipality, a well-designed solar water heater programme ran foul of the city treasury (it threatened electricity sales and thus revenue), electricity department (impact on the load profile, technical issues and revenue), procurement department (selection of different equipment service providers), housing department (roof strength issues of some government housing), and legal department (ownership of equipment and tendering processes), which delayed progress by several years. This was after an agreement that such a programme was economically, socially and environmentally beneficial, and it was included in the official municipal energy and climate change strategy. Behind all of this resistance was more than just defensible concern, but the fact that officials were busy and many did not welcome additional or different responsibilities.

It is important to again emphasise that ‘outsiders’ cannot easily know the inner dynamics of municipalities, and thus attempts by those not deeply familiar with municipalities to effect change in this arena are often unsuccessful. This gap in understanding also explains the glaring misalignment of a large proportion of the outputs from researchers, consultants and development institutions with the needs of the intended municipal ‘knowledge recipients’, and the predictably absent impacts. In addition, along with probably most forms of government the world over, municipalities are heavily subject to idiosyncrasies associated with politics and power. The approach which helps negotiate some of these pitfalls is to become a close part of the municipal team when it comes to implementation support. ‘Walk the road’ of implementation together, learning as you go, providing sensible support along the journey, and being there for the several years that it may take to achieve some implementation success. Externally formulated frameworks or timeframes are of limited worth, and typically formulated ‘project’ style interventions often fall short in this context.

The intermediary is likely to only be able to provide a limited range of implementation support. There is often a role for specialists to enter the process for limited periods, although this is best if it takes place through the intermediary, thus affirming their worth as a supportive partner to the municipality. For example the intermediary may be able to provide little input on the financial and technical feasibility of landfill-to-energy project which a partner municipality is keen to pursue. ‘Rubbing shoulders’ with external experts not only provides the exact support being sought by the municipality, but also builds the capacity of the intermediary to better fulfill this role in future.

The intermediary also has an important knowledge development and mediating function. It takes the technical input from the specialists and futures modeling work and brings it to municipal decision-makers in an accessible way, and also researches, develops and communicates knowledge around key issues such as legal mandates, procurement approaches, and technical issues such as efficient public lighting, as the needs arise. The communication of knowledge is done through municipal meetings and workshops in addition to document development (our experience is that documents by themselves have limited impact without a concomitant communication process).

3.5 Capacity building activities

Although doing the work described above is definitely the major capacity building activity, other more formal capacity building activities can strengthen this objective significantly. We have found the following to be effective in this regard:

- Lessons sharing via ‘Networking events’ – where municipalities, not just limited to those where formal partnerships have been established, meet to share lessons around implementation of particular projects. As noted earlier, experience shows that when one municipality has made some progress with implementation, others follow much more readily. These events should preferably be

quite specific, so that the detailed challenges and solutions encountered can be worked through, and municipal staff can grapple with the detailed issues and problems they face. Again, outside experts, while they may be technically well-informed, are often not able to relate to the complex municipal situation and so may be of limited use.

- Formal ‘Masters level’ courses (re-skilling of professionals) – typically these would be week-long events contextualizing the African urbanization and sustainable energy context, covering options and approaches available, and drawing on practical experience of what has and has not worked in addressing challenges. Field visits can also be useful. These courses would be run by the support intermediary, thus building their capacity and profile. Such courses are relevant to participants beyond just the municipalities, including other spheres of government, academics, consultants, development workers, aid organisations and NGOs, and also tend to have an important mutual-learning function because of the range of experience and perspectives within the participant group.

3.6 Networking: local, national and regional reach

The networking function of the methodology not only facilitates lessons sharing, but builds relationships between municipalities and enables the development of common positions. This can result in a stronger voice to national government on key issues of concern to municipalities and influence national policy in this regard, potentially leveraging resources to support a sustainable energy transition at a local level. In South African, for example, the networking function was helpful in developing a strong joint municipal input into the national electricity planning process, resulting in their concerns and detailed local knowledge being included in an unprecedented way.

If the learning network is found to be worthwhile, it will tend to grow, drawing in other municipalities and a greater range of municipal departments.

3.7 Regional programmes

Although the methodology described can be applied successfully in one country, which is how it was developed, as noted previously there are benefits to spanning several countries as it broadens the spread of approaches used and results in ‘meta-lessons’ which can impact on international development organisation programmes and align support accordingly. It can also help raise the profile of urban issues in the Sub-Saharan African context, where rural concerns have historically dominated political agendas²². It is also worth noting however, that such multi-country initiatives would often cover municipal contexts, including regulatory and institutional environments, which may not be easily transferrable. For example, in South Africa many municipalities are electricity distributors, and thus have a partial focus on electricity access and revenue issues, which is a rare situation in other African countries.

4 Important operational principles

Through implementing a similar programme to that described above over the past 16 years, various pragmatic ‘operating principles’ have emerged. The approach to the programme should be flexible enough to accommodate these.

Firstly, there is a definite role for opportunism. Municipalities, as illustrated earlier, are often idiosyncratic in behavior, and thus a priority in an energy strategy, for example, may for various reasons, rational or otherwise, not be the most effective area in which to invest effort. There may be little point in supporting a sensible change in land use planning if it is known not to suit strong political agendas for example. A more indirect approach may be appropriate, or it may be best to wait for a more opportune time to engage with the issue. Being opportunistic doesn’t mean that approaches are not systematic. The overall approach

²² Parnell S, Pieterse E (Eds) 2014. *Africa’s Urban Revolution*. UCT Press, Cape Town.

should be systematic, but effort is invested in a pragmatic manner. One could call this ‘systematic opportunism’.

As a second operating principle, it can be important to be constantly supportive of key municipal staff interests, even if these are not stated top priorities in a formal strategy. The success of the programme, and ultimately the impact on the problems of sustainable urban energy transitions, revolves around the goodwill of the municipal partner. In addition, municipalities are often understaffed and so it is worth being careful not to add to their burden of meetings or emails unless it is of real benefit to them. This is particularly important at the start of a programme, when the usefulness of the intermediary is not yet clearly established. Later, when the benefits of the programme are more widely appreciated, a steady shift to the stated priorities rather than the interests of municipal staff may be appropriate.

Finally, it is worth linking with the ‘champions’ within a municipality who are keen to see change. Sustainable energy interventions are often new ground for municipal staff, and this requires a shift in standard work approach, a stretching of fixed job descriptions, and a little extra personal effort on their part. Where there is little interest, there will be little change. Creativity and responsiveness can be important to keep the process vital and engaging.

5 Where have we got to?

In previous work in South Africa, SEA have adopted the role of trusted intermediary, which is central to the methodology. Almost by definition there is no equivalent organization in either of the two other partner countries in the SAMSET project, Ghana and Uganda. Therefore, it is the SAMSET team itself that fulfils this role, and the local partners in particular, given that they are the local face of the team; these are the Institute of Statistical, Social and Economic Research at the University of Ghana (ISSER), and the Faculty of the Built Environment at Uganda Martyrs University. Shortcomings of academic institutions in this role have been highlighted above, but given the research content of the SAMSET project, they have proven to be ideal partners. Each has experience of applied research in urban energy, so they (along with SEA in South Africa) have been instrumental in mobilizing local authorities to participate in the research project:

- Jinja Municipality and Kasese Municipality (Uganda);
- Ga East Municipality and Awutu Senya East Municipal Assembly (Ghana);
- Polokwane Municipality and Cape Town (South Africa).

The structured work stream starts with a range of activities designed to help stakeholders understand the urban energy context within which they are working, including research activities designed to fill information gaps that become evident. Given that partner authorities in Uganda and Ghana are starting with a (nearly) clean sheet of paper, this is expected to be an intensive and time consuming exercise, and this is where project activities have focused to date.

- State of energy report. Partners have drafted reports for each municipality, gathering data on energy sectors (residential, commercial, industrial, transport, agriculture), how the urban situation fits into regional and national contexts, and policy frameworks. This is supported by national energy reports, based on literature reviews.
- Netmapping. Given the emphasis of the methodology on partnerships, consensus, and networking, and the importance of working in concert with broader municipal strategies, it is important to have a good understanding of key stakeholders involved in urban energy, and any interdependencies that may exist. A netmapping exercise was, therefore, carried out in all three countries.
- Local research. Partners have initiated local research activities (e.g. household surveys) to start filling information gaps that have become evident so far.

- Capacity building activities. Partners have shared experiences at a number of collaborative workshops, and the team have conducted a week long Masters’ level course at University of Cape Town, attended by approximately fifty participants.

5.1 Comparison of contexts

Although it is too early in the project to see any material changes (partner municipalities have yet to draft a Sustainable Energy Strategy, let alone start to implement them), some interesting differences between the contexts have already come to light.

Urbanisation

Urbanisation is a common feature across all three of these countries. 62% of the population of sub-Saharan Africa live in slums, and 60% work in the informal economy – 78% in Francophone countries. The data in Table 1 shows that urbanization is considerably lower in Uganda, although the urban growth rate is higher, so this gap is forecast to decrease. Informality is no longer the exception, yet city planners often still see informality as illegality. How authorities handle informality is one of the key differences between the three country contexts – whereas in South Africa service delivery programmes have prioritised these areas since the advent of democracy in 1994, planning authorities in Ghana lack the political will (and resources) to efficiently plan and develop cities. Urban development in Uganda is characterized by sub-division of plots as a result of population growth and urban migration, which has led to many plots lacking access to services.

Table 1 Population and urbanisation data

	South Africa	Uganda	Ghana
Population	53 Million	36 Million	23 million
Urban population	64%	18%	53%
Population Density (People per sq. Km)	42	137	101
Countryside population Growth	0.1%	3%	1%
General city growth	2-3%	4-5%	3,8%
Key city growth	Over 4%	Over 4%	3,1% (Accra)
Key City Population Density (People per sq. Km)		7-9000	10000 (Accra)
Proportion living in Key city in informal settlement		60%	

Urban energy context

Several commonalities exist in the state of energy picture in these three countries: significant energy expenditure in the residential and transport sectors is a common theme, as well as high proportions of informality, both in the residential and commercial sectors.

Yet there are important differences between South Africa and the other countries. Differences centre on availability of electricity. Firstly, South Africa has a long history of supporting poor households to access high quality energy (electricity). As noted in the latest State of Energy in South African Cities 2015²³ and the national Development Plan²⁴, the Integrated National Electrification Programme (INEP) has seen household electrification rates jump from 36 % in 1994 to 87 % in 2012, and the Free Basic Electricity policy allows indigent households 50kWh of free electricity per month in order to meet basic energy needs. The use of electricity for cooking has shown the largest increase (23%) relative to other end uses. Secondly,

²³ State of Energy in South African Cities 2015. Sustainable Energy Africa, Cape Town, South Africa.

²⁴ National Development Plan (2030), 2013. National Planning Commission, Office of the Presidency, Government of South Africa. Pretoria.

municipalities are responsible to providing electricity to customers in urban areas, reselling electricity from Eskom, which serves customers directly elsewhere.

In Uganda, the most pressing energy issues centre on biomass use, both wood and charcoal. Charcoal represents a larger share of the biomass used in cities, and prices vary from city to city (by a factor of 2). Forest cover in many rural areas of the country has been reduced to as low as 5 per cent

Domestic energy consumption in Ghana is characterized by a diversity – people use lots of different fuels, although charcoal dominates in the urban areas for cooking and water heating. The empirical pattern of changes in preferred fuels and fuel use transition shows that Ghana is gradually moving from woodfuel to charcoal and gas energy sources for domestic activities such as cooking and heating water in urban areas. Despite the Ghana Government's goal to encourage the use of modern cooking fuels such as Liquefied Petroleum Gas (LPG), LPG use in slums remains low (4.6%) because it is regarded as too expensive. Electrification in urban areas is high at around 79%, even if nearly half of these were 'illegal' connections²⁵.

Of course, energy balances and policies are likely to change in the medium term future as oil production is ramped up in Ghana and reserves in Uganda become tapped and refined.

Transport

In South Africa, its sprawling, low density cities have been inherited from days when transport costs were low, and land was more freely available. Dependence on private vehicle use is widespread, and infrastructure costs to provide adequate public transport are prohibitive. Urban rail is a national government function and most bus services are provincially controlled, making integrated transport planning difficult and inefficient, and even within the same urban boundary, different roads can be the responsibility of different spheres of government.

In both Ghana and Uganda the increasing number of private cars (and motorcycles) has put immense pressure on existing transport facilities. Most residents rely on almost unregulated minibuses, and intercity public transportation is likewise dominated by minibuses (*matatu* or *taxi*) which lack any oversight or coordination from central authorities.

Urban governance

All three countries have 3 spheres of government - national, provincial and local or municipal. In spite of a clear separation of most mandates and functions in South Africa, policies across the three spheres of government, or even in any one sphere, are often poorly coordinated or conflicting. Urban government structures in Uganda are complex and involve several layers of elected and appointed officials.

Local government associations in South Africa (SALGA) and Uganda (ULGA) provide a coordinating function amongst local government, and represents local government to national government.

The planning instrument in South Africa is the Integrated Development Plan (IDP), which covers a 5 years period. Plans have been written for over 60 town councils in Uganda over the past 15 years, many of which now need updating.

Funding

The ability to raise revenue, and to finance sustainable energy strategies is the point at which decentralized governance structures really starts to matter.

²⁵ Information from Energy Outlook for Ghana 2014. Energy Commission, Accra, Ghana (April 2014)

- In **South Africa**, Local government is able to raise revenue from property rates and service delivery payments, amongst other sources. They are also the recipient of various conditional and unconditional grants from national government, including the Equitable Share Grant (which includes the Free Basic Electricity grant) and the Municipal Infrastructure Grant. Electricity sales are a critical source of revenue for many municipal distributors as it cross-subsidises other important municipal functions. Municipalities are also able to raise loans.
- The District Assemblies in **Ghana** are tasked with raising taxes. Local government also receives a guaranteed amount of income from central government which can be used at its discretion, providing some amount of financial independence.
- In **Uganda**, the Ministry of Local Government manages the funding to districts and Local Councils of various levels; most district and local governments derive the vast majority of their operating revenues and infrastructure investments through grants from national government. The inconsistency of these payments gives rise to stresses at municipality level. Local governments are able to raise revenue from property rates and service delivery payments. Municipalities are not currently able to raise loans; however KCCA has been given a mandate to do so.

Energy is not high on the agenda of local authorities in Ghana and Uganda, who might be tempted to turn to the international community for funding. However, in his blog on financing a low carbon urban Africa, Jonathan Silver argues that carbon financing, for example, has not reached urban Africa.

5.2 Key players

The netmapping exercises started by identifying all stakeholders involved in urban energy planning and service provision, and then went on to conduct a stakeholder analysis using the matrix mapping exercise outlined in Figure 5-1 in order to identify key stakeholders.

The foundation work done by SEA in South Africa has been done with municipalities as the core implementing partners, so it was not surprising to find that that the stakeholder analysis attributed these types of institutions (Metropolitan Municipalities, Small Municipalities, and District Municipalities) with a high degree of influence on household and buildings energy.

In Ghana and Uganda the structure of local government is different and responsibility of municipalities for energy is significantly different. Then Ministry of Energy, the Energy Commission and the Municipal Assembly were attributed with high authority and interest in household energy transitions in Ghana. In Uganda, it was the Ministry of Energy and Natural Resources, and the Ministry of Local Government, and even the East Africa Community, which was interesting because it implies that highly influential powers lie at a supra-national level. The Ugandan stakeholder analysis was interesting because it identified institutions regarded as particularly powerful, yet not engaged with the clean energy agenda, notably the the political arm of the government and the electricity regulatory authority. This raised the question of how interested parties can engage with these players to get them on board.



Figure 5-1 Representation of the stakeholder matrices

5.3 Insights into transferring the Methodology

It therefore seems important to understand the local context, including the relevant roles of the local government. In South Africa, as the netmaps suggest, the municipality is a key decision maker in most energy transitions (within their location). However, in Ghana and Uganda, the national stakeholders seem to hold a greater significance. This suggests that the next steps, which include drafting strategic plans for the municipalities, need to engage not only the municipal stakeholders but some strategic national actors as well. It may be that the methodology should also be tailored to bring national level authorities more closely into the partnership, rather than focusing on municipal authorities.

Moreover, the stakeholders to be incorporated into the methodology will depend on the specific energy transition of interest. For instance, in South Africa, there is a cluster of government and other institutions that are key to the clean energy agenda, including the National Treasury, National Business Initiative, the Green Buildings Council of South Africa, and the Department of Environmental Affairs. However, when considering transport energy, the Department of Transport and the Taxi Associations come into play. This is important when applying the methodology in Ghana and Uganda, because the priority energy transitions are quite different. In some respects collaborative working may be easier in Ghana and Uganda because there are fewer formal institutions engaged with energy transitions, but on the other hand, upwards accountability to national level bodies may make it more difficult to secure decision making.

Given that partners in Ghana and Uganda are currently conducting local research in order to fill some information gaps, it is too early to comment on the Sustainable energy strategies, or on how these are to be implemented. However, accessing funding to implement the sustainable energy strategy will clearly be important. Again, the more remote locus of decision making authority in Ghana and Uganda compared with South Africa may well mean that partners there find it more difficult to secure funding, in which case additional effort will be required.

6 Working through non-municipal channels

It seems an inevitable conclusion that municipal capacity, when weighed against service delivery and other demands placed on local government, will remain far from adequate into the future, potentially even in the long term. The facts of the situation give little reason for more optimism. Currently almost two thirds of the urban population in Sub-Saharan Africa live in slums²⁶, most urban development in this region occurs in a completely unplanned and non-transparent manner²⁷, and there is increasingly an acknowledgement that informality is a permanent part of the African landscape. In addition, economic growth in Sub-Saharan Africa has been falling short of hoped-for levels, and significant improvements in income levels are unlikely.

For these reasons sustainable energy transitions will need to look beyond just local government-led initiatives. People themselves, ordinary urban inhabitants, always put some systems in place to make their lives more workable, as amply demonstrated in informal urban situations. It therefore seems appropriate to turn more attention to the issue of supporting the initiatives and innovation of poor informal settlement dwellers with energy concerns in the face of capacity inadequacies of municipal governments. They know their situation, needs and opportunities better than anyone. Slum Dwellers International is one such organization that has much experience working in this way, albeit often not specifically dealing with sustainable energy. This represents a further devolving of approach from local government to the community level. The methodology described above does not yet deal with such an approach adequately, but it appears important to move in this direction.

7 Conclusion

It seems overdue that the world take far more notice of the extent of the crises facing urbanizing Sub-Saharan Africa, and come forward with more effective and comprehensive responses. In fact the magnitude of the problem arguably places it amongst the great global crises facing humanity today.

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. We believe the methodology described herein can make a significant contribution in bolstering municipal ability to respond to these challenges.

Experience to date shows that the key components can be resourced from within other countries in Africa, notably technically competent institutions to act as local intermediaries. Municipal authorities have engaged with the project, confirming that there is appetite for addressing sustainability of urban energy provision.

Differences in the composition of urban governance, and in the priority energy transitions facing municipalities in different countries have already highlighted how the methodology needs to be tailored to individual country contexts in order to work effectively.

²⁶ Planning Sustainable Cities. Global Report on Human Settlements. UN-Habitat, 2009.

²⁷ Who Will Plan Africa's Cities? Counterpoints: Africa Research Institute, September 2013.