

# Regulatory and Literature Review

## Promotion of Energy Efficiency in Municipalities

SACN Programme: Sustainable Cities

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## Acronyms

DoE	-	Department of Energy
DSM	-	Demand Side Management
DTI	-	Department of Trade and Industry
EE	-	Energy Efficiency
EEDSM	-	Municipal Energy Efficiency and Demand Side Management programme
ERA	-	Electricity Regulation Act 4 of 2006
ESCO	-	Energy Service Companies
HVAC	-	Heating, ventilation, and air conditioning
IDP	-	Integrated Development Plan
KPI	-	Key Performance Indicators
MFMA	-	Local Government Municipal Finance Management Act 56 of 2003
NBRBSA	-	National Building Regulations and Building Standards Act 103 of 1977
NERSA	-	National Electricity Regulator of South Africa
RDP	-	Reconstruction and Development Programme
SABS	-	South African Bureau of Standards
SACN	-	South Africa Cities Network
SALGA	-	South African Local Government Association
SDF	-	Spatial Development Framework
SPLUMA	-	Spatial Planning and Land Use Management Act 16 of 2013
SWH	-	Solar Water Heating

## Acknowledgments

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## Executive Summary

The South African Cities Network (SACN) commissioned a project to define a Regulatory Framework to Promote Energy Efficiency in Municipalities. Part of this process involves a regulatory review on the use of laws, by-laws and other regulations to ensure the uptake of Energy Efficiency (EE) measures at municipal level. This is a desktop exercise that looks at literature, legal opinions and laws on EE. Rather than make exhaustive recommendations on what should be done legislatively, it points out important emerging issues that are further examined in the case study and gap analysis stages.

It is clear that there are already numerous instruments with legal clout that can be used to ensure that EE measures are complied with. Additional regulations and by-laws are being formulated by municipalities; an example is the Green Buildings Development By-law in Tshwane. As a relatively new approach, it would be interesting to examine whether there are additional benefits of taking this route. Nevertheless, the current extensive regulatory framework around EE implementation is well supportive of EE at municipal level.

Often the challenges are regulatory, but not because of a lack of regulations. According to the literature, conservative or wrong legislative interpretation can hamper introduction of EE projects at a municipal level. In tandem to that, is lack of EE performance based measures for municipal staff. Yet also, some of the laws and regulations emerging at national level may not be implementable because of problems with the laws themselves. All this should become clearer from the case studies.

There are also many non-regulatory issues. Important ones include better maintenance of municipal infrastructure as an effective EE measure as well as better intergovernmental coordination. There are some important emerging initiatives on intergovernmental coordination, although all indicators are that there is room for improvement. The report has also shown that while more efficient spatial forms have potential benefits for EE, this has generally not been an area of emphasis. Indeed, the benefits of spatial interventions are generally not seen in terms of their EE benefits.

The report shows that regulatory interventions need to be cognisant of some important contextual factors. The most important of these is the perceived notion of built-in dis-incentives for municipalities to regulate for EE, related to the threat to revenue sustainability. The literature shows that there are clear counter arguments to this notion, and the SACN is well poised to champion this debate. Further, there are fiscal instruments that have been introduced to mitigate these disincentives. An important area of examination and research is an examination of whether the instruments work in practice. Finally, many EE driven legislative frameworks are highly technical, and require specialised capacity to implement them. This is not always available at municipal level.

## 1. Background

This review, the first in a series of deliverables for the project, contains a literature scan on how legislative frameworks are treated by writers when considering EE. It also examines laws, regulations, by-laws and standards that have ‘legal teeth’ and are used or can be used for energy efficiency. The review also seeks to understand from the literature, as far as possible, how regulations that are already in place are performing with regard to EE. From it, two case studies (Cape Town and Tshwane), an identification of gaps and opportunities as well as an overall synthesis report for specific regulatory interventions on EE at municipal level would be developed.

## 2. Defining the Regulatory Problem

### 2.1. The regulatory question

Substantial work has been done on EE and related topics in municipalities and the intention of this project is to build on these initiatives. Most of the work done cover aspects of the legislative environment and generally frame the challenges around it in a number of ways. Firstly, literature points out that it is because local government has failed to utilise its legislative powers, specifically with regard to creating by-laws, that EE measures have found it difficult to gain traction.<sup>1</sup> A 2013 SACN report notes that,<sup>2</sup>

*It is interesting to note that although municipalities are empowered to pass by-laws for EE and RE measures, the preferred approach up to date has been to develop policies, plans and strategies. These policies, plans and strategies do not impose the same legal obligation as created by by-laws*

And continues to add that,

*(Municipalities need to) Develop by-laws or regulations – As discussed, although numerous policies and plans exist showing municipal intent to implement EE and RE initiatives, these do not enforce action. Municipalities should develop by-laws to enforce implementation of the initiative.*

The review has shown that policies, plans and strategies at a municipal level are failing because they are not supported by the force of law. The City of Tshwane’s actions towards supporting its Green Buildings Development Policy is often highlighted as an example where a by-law has been used to enforce certain aspects of the policy.

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<sup>1</sup> See for example Glazewski, J. and Collier, D. (2013) Achieving climate resilient and low carbon city: a governance framework for this City of Cape Town; Salga (undated) Status Quo Local Government Energy Efficiency and Renewable Energy Strategy

<sup>2</sup> South African Cities Network (SACN). Consolidation of the lessons learnt for EE and RE initiatives within cities: development of a roadmap for future uptake, Report by Aurecon.

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Secondly, reports and legal opinions that point to specific legal problems in implementing EE at assist in clarifying specific regulatory uncertainties and challenges at local government. The uncertainties include:

- Legal barriers for entering into Public Private Partnerships for EE<sup>3</sup>.
- How to use the planning regulatory system to ensure EE.<sup>4</sup>
- Legal challenges to municipalities facilitating embedded electricity generation.<sup>5</sup>
- Legal opinion on the use of by-laws to enforce various EE measures such as solar water heaters and whether approval of national government is necessary when such by-laws are proposed.<sup>7</sup>
- The potential role of regulations in land use management in enhancing EE.<sup>8</sup>
- Implications of the Local Government Municipal Finance Management Act 56 of 2003 (MFMA) with regards to municipal building retrofit programmes.<sup>9</sup>

Outside these specific reports and legal opinions, there is broader literature that may highlight a number of legislative and legal problems at a macro industry wide level, as well as those specific to local government. The National Treasury and Western Cape Government's Diagnostic Report on Barriers and Challenges to Implementing Climate Change Projects is an example of this, concerned with how the municipal financial regulatory environment is a challenge to implementing EE.

The SACN has a series of reports based on its flagship, State of City Finances Reports that deal with municipal finances. These are particularly useful in looking at the financial incentives and challenges to pursuing EE agenda among municipalities. This contextualises the regulatory argument and helps to understand why often, there is little incentive to introduce some of these regulations at a municipal level.

Much of the literature moves away from the notion that the problem is necessarily always a lack of appropriate regulatory frameworks. Some literature emphasises wrong interpretation of the legislation as the main problem. This is especially so with regards to regulatory problems when dealing with municipal financial frameworks.<sup>10</sup>

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<sup>3</sup> De Visser, J. (2012). Cities and Climate Change, University of the Western Cape Community law Centre.

<sup>4</sup> Glazewski, J. and Collier, D. (2013).

<sup>5</sup> eThekweni Municipality (2013) Literature Review for legal Framework for Municipal Engagement with embedded electricity generators.

<sup>6</sup> See De Visser, J. (2007). Legal opinion on City of Cape Town's proposed solar heating bylaw, Report done for Sustainable Energy Africa.

<sup>7</sup> De Visser (2007).

<sup>8</sup> Glazewski et al (2013).

<sup>9</sup> Ruda, M (2007) *Legal opinion: whether section 33 of the MFMA is applicable to the energy efficiency building retrofit program*

<sup>10</sup> See for example National Treasury (2013) Diagnostic Report.

## 3. The Legislative Framework

### 3.1 Mandates powers and functions

#### 3.1.1. The role of national government

The South African Constitution creates a government consisting of the national, provincial and local spheres of government and allocates powers to each of these spheres of government.<sup>11</sup> National legislative authority is vested by virtue of Section 44 of the Constitution. This section confers on the National Assembly the power to amend the Constitution, and to pass a law on any matter, including matters within a functional area listed in Schedule 4. There are multiple areas within EE, which can be regulated and these include: energy, the environment, housing, public transport, road traffic regulations and urban and rural development. Further, national government may assign any of its legislative powers, except the power to amend the Constitution, to any legislative body in another sphere of government.<sup>12</sup>

#### 3.1.2. The role of provincial government

The Constitution divides the republic into nine provinces and provincial legislative authority is vested in them by virtue of Section 104. The provincial legislature may pass legislation for its province on any matter within a functional area listed in Schedule 4 and Schedule 5, the former of which it shares a concurrent power with national government. Thus, in addition to the areas mentioned above relating to EE, the provincial legislature under Schedule 5, has additional powers such as those related to 'provincial planning' and 'provincial roads and traffic'. It may also legislate for functional areas expressly assigned to it by national legislation, and any matter for which a provision of the Constitution envisages the enactment of provincial legislation.

#### 3.1.3. The role of local government

Although climate change, renewable energy and energy efficiency are not listed as specific local government functions, it is clear that municipalities have a central role to play in the overall national effort to ensure these.

A municipality has executive authority and has the right to administer on local government matters listed in Part B of Schedule 4 and Part B of Schedule 5.<sup>13</sup> Listed under Part B of Schedule 4 and with implications on EE include: air pollution; building regulations; electricity and gas reticulation; municipal airports; municipal planning; municipal public transport; municipal public works; harbours; storm water management; water and sanitation supply systems. Part B of Schedule 5, includes billboards; markets; municipal abattoirs; public

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<sup>11</sup> Section 40(1).

<sup>12</sup> Section 44(1) (iii).

<sup>13</sup> Section 156(1) (a).



places; street lighting; and traffic and parking. This means that municipalities can make policy regarding these issues. Municipalities can also make and administer by-laws for the effective administration of these matters.<sup>14</sup>

**Table 1: Areas influencing energy efficiency where municipalities can exercise their legislative powers**

Schedule 4B	Schedule 5B
Air pollution	Billboards
Building regulations	Cemeteries funeral parlours
Electricity and gas reticulation	Local sport facilities
Municipal Airports	Markets
Municipal planning	Municipal abattoirs
Municipal public transport	Municipal parks and recreation
Municipal public works	Municipal roads
Harbours	Public places
Storm water management	Street lighting
Water and sanitation supply systems	Traffic and parking

EE and other related measures often derive from the municipalities other powers and functions as provided by the Constitution, and may not be directly related to a municipal legislative mandate. This is because functional areas as defined by the Constitution cannot be regarded as existing in 'hermetically sealed compartments'.<sup>15</sup> This is important, as often municipalities do not take action regarding EE measures because they wrongly believe these to be out of their powers and functions. It also means that municipalities can exercise their original powers in legislating on EE. If there is no national or provincial law regarding the EE, there is no limit to the scope of municipalities and they can, for example create a by-law on solar water heaters (SWHs) without the consent of national government under the National Building Regulations and Building Standards Act, Act 103 of 1977 (NBRBSA) as the requirement for approval offends municipal autonomy (De Visser, 2007).

### 3.1.4 National and provincial government supervisory role

While local government may legislate on Schedule 4B and 5B matters, the Constitution does not allocate the matters in Schedule 4B and 5B exclusively to local government. National and provincial governments may also regulate those matters. (Steytler and Visser, 2013). National government can legislate on Schedule 4B matters on the basis of Section 155(7) of the Constitution, which affords it the power to 'regulate' the exercise of municipalities' executive authority. The constraints to this authority are related to the fact that it should be exercised in the context of seeing to the 'effective performance by municipalities of their functions in terms of

<sup>14</sup> Section 156(2).

<sup>15</sup> Wary Holdings (Pty) Ltd V Stalwo (Pty) Ltd and another (1) SA 337 (CC) para 131.

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Schedule 4', which means broad managing or controlling rather than direct authorisation. Overall, this means that the regulatory power enables national government to set essential national standards, minimum requirements and monitoring procedures among others. The Constitution also provides that a by-law which conflicts with the national or provincial legislation is invalid in as far as the national and provincial legislation does not impede on the municipalities ability to exercise its powers and functions.

## 3.2 The regulatory environment

The regulatory environment for EE is examined according to the following:

- Areas of the municipality's day-to-day operations, including municipal offices, schools, clinics, streets and roads, etc.
- Services that the municipality sells, including electricity, water, gas and sewer services
- Areas the municipality regulates, including city planning (building regulations, strategic and statutory planning) and air-quality.
- The infrastructure provided by the municipality including grid-networks and related infrastructure such as roads, water, electrical, sewage and gas etc.

### 3.2.1 Municipal operations

EE issues can be traced to a number of important areas:

- Buildings: besides their own buildings and facilities for official use, municipalities are landlords of property and buildings in diverse use-categories such as clinics, residential and community centres.
- Plant and machinery: this includes fleets of vehicles, petrol and diesel or electrically operated equipment of various types, especially for purposes of maintenance of municipal infrastructure and offering direct services like public transport, water and waste removal.
- Street and traffic lights.
- Low cost housing: municipalities are major players in delivery of subsidised housing at various stages, even though the core responsibility falls on provincial government. However, given the accreditation process, this is changing in the larger cities.

The municipalities' own consumption is an important area of intervention and although energy consumption for municipalities (metro and smaller) is between 1% and 2% of the total energy consumed, it is still an important component, especially to show leadership.

#### **Relevant regulatory framework and literature review**

The regulatory framework is found in national or provincial legislation and in municipal by-laws. Budgets, IDPs and Spatial Development Frameworks (SDFs) are part of the regulatory framework binding on municipalities because they are legally binding on the municipality's decision-making. Any requirements that relate to EE by the municipality therefore have the force of law if entrenched in these documents. Voluntary standards for EE,

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for example, aspects of ISO 50001 can be embedded in these documents to give them the necessary legal teeth.

For municipal buildings, the regulations most commonly invoked are the nationally applicable energy efficiency building regulations SANS 10400-XA, which apply to all new buildings, including those belonging to municipalities. There are other national regulations regarding infrastructure under control of municipalities. Reconstruction and Development Programme (RDP) houses for example, are developed under the Department of Housing, 2003) design and construction specifications.<sup>16</sup> Recently, these have been enhanced through a circular by the national Department of Human Settlements, that requires norms and standards regarding the construction of RDP houses be enhanced to comply with SANS 10400-XA. These enhancements for the minimum size 40 square meter house, to improve the thermal performance of the dwellings include:

- The installation of a ceiling with the prescribed air gap for the entire dwelling.
- The installation of above-ceiling insulation comprising a 130mm mineral fibreglass blanket for the entire house.
- Plastering of all internal walls.
- Rendering on external walls.
- Smaller size windows.
- Special low E clear and E opaque safety glass for all window types as prescribed.

Importantly, these and other non-related enhancements have been accompanied by an adjustment to the subsidy, now amounting to R110 947,00. (National Department of Human Settlements, 2014).

For street lighting, SANS 10098-1 details the technical standards for public lighting in Group A and B roads. Also, at a national level, regulations promulgated under the Electricity Regulation Act 4 of 2006 (ERA) require licensees to adhere to certain norms and standards regarding the services they provide. Municipalities are licensed as distributors of electricity by National Energy Regulator South Africa (NERSA) under section 7(1) (a) of the Act. The Act provides that:

- Street and highway lighting must be energy efficient, switched off during the day and must have energy efficient bulbs fitted.
- Lighting of unoccupied buildings especially after working hours should be reduced and incandescent lights should be substituted by energy efficient alternatives.<sup>17</sup>

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<sup>16</sup> DoH (2003). Design and construction of houses: Project linked greenfield subsidy project developments – Generic specification – GFSH.11 DoH Pretoria.

<sup>17</sup> See Electricity Regulations for the Prohibition of Certain Practices in the Electricity Supply and Compulsory Norms and Standards for Reticulation Services and Electricity regulations for compulsory norms and standards for reticulation services.

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The Municipal Energy Efficiency and Demand Side Management programme (EEDSM) implemented by the Department of Energy (DoE) with National Treasury, funds public lighting (street, traffic signal and building), building efficiency audits and retrofits (including HVAC, efficient water heating, and energy management devices) as well as the implementation of water and sanitation efficiency. This financial incentive is intended to accompany the legislative mandates and requirements above.

Together with this financial incentive, there is a substantive process of ensuring municipalities retrofit their facilities to be more energy efficient, driven by the Department of Public Works at national and provincial level, the department of environment and other related departments. This has resulted in some of the larger cities creating dedicated EE offices for this purpose. There has also been considerable concrete action in many cities regarding this. For example, the City of Cape Town has to date, retrofitted traffic lights with light emitting diodes; retrofitted 25,000 street lights; undertaken to retrofit of four large buildings; undertaken lighting retrofits of 14 buildings; installed 77 solar water heaters in facilities; installed 55 automated meter reading devices; installed a 10 kW peak solar array. These actions at a city level, as well as for national and provincial assets, are receiving support and attention through initiatives such as the Vertical National Appropriate Mitigation Actions (VNAMA), which are geared at implementing flagship programmes for enhancing EE in public buildings and facilities in municipalities and provinces.

Intervention by municipalities regarding their own operations has received the most attention, relative to other areas. The regulatory environment, with the national standards under ERA as well as SAN 10400 XA, provide considerable regulatory backing to these actions. Further, through its own initiative, the municipality can entrench EE by including it in statutory documents such as IDPs.

### 3.2.2. Services the municipality sells

Municipalities provide a whole menu of services that are sold to the public, the primary ones being electricity and water, and to a lesser extent gas. Transport services are also important in the larger metros. This analysis looks particularly at electricity.

EE with regards to electricity is dealt with by literature extensively, particularly at the post-metering stage. These measures are largely aimed at Demand Side Management (DSM) and regulatory exploration here is thin. Instead, the most important DSM influences are noted to be pricing, and to a lesser extent information dissemination and communication to change behaviour.

#### **Relevant regulatory framework and literature review**

##### Electricity

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Electricity reticulation is one of a municipality's constitutional competencies. Slightly more than half of all consumers have this service provided to them by municipalities, with the other half provided by Eskom.<sup>18</sup> The ERA 4 of 2006 as amended in 2007 sets out the policy for the electricity supply industry. The Act details the legislative requirements with regards to the generation, transmission, distribution, dispatch, reticulation, import, export, dispatch and trading of electricity. The ERA appoints the NERSA as the custodian and enforcer of the regulatory framework provided for in this Act. NERSA is responsible for the issuing of licences, setting and approval of tariffs,<sup>19</sup> register persons not required to hold a license, and enforce performance and compliance with the Act and license conditions. Licensing is for, among other areas, to generate, transmit, distribute, import, export and dispatch electricity.

Pricing has a big influence on EE at household and commercial level. Prices are firstly set by Eskom, which generates the electricity. Local government which buys the electricity then has the power to set its own tariffs in terms of the Local Government Municipal Systems Act 32 of 2000 (Systems Act) Section 75A with guidance from NERSA. It can also create by-laws regarding electricity tariff setting under Section 41(a). In addition, local government, can, through the Municipal Fiscal Powers and Functions 12 of 2007 implement a municipal surcharge. In pursuit of the policy goal of certainty and predictability in budgets, Section 28(6) of the MFMA provides that municipal tariffs may not increase during the financial year.

Some literature is of the opinion that the significant powers given to NERSA in the tariff setting process conflicts with the municipalities own powers to do so.<sup>20</sup>

### Gas

The regulatory framework for gas at national level is framed by the National Gas Act 48 of 2001, which provides for the regulation of the piped gas industry through the establishment of a national gas regulator to promote and facilitate investment in the industry. The primary regulatory EE mechanisms are licensing and tariff setting.

By-laws are used by municipalities primarily to target licensing gas operators.<sup>21</sup> These deal with quality and safety standards, system operating procedures and emergency response plans, liability insurance, expansion of pipelines etc. The municipality also has the power to describe the methodology to set tariffs if the supplier 'exerts significant market power'. Importantly, tariff setting takes into consideration protection of consumers; fair return on investment; encouraging efficiency of the provider and promoting economic use of gas. The licensing system seems to presents some opportunity for exerting influence on operations, for greater EE in gas distribution.

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<sup>18</sup> Eskom distributes electricity to 3 962 394 consumers (approximately 110 051 GWh of annual sales) and municipalities have 4 381 762 (approximately 82 720 GWh sales).

<sup>19</sup> Through annual guidelines on tariff increases for municipalities.

<sup>20</sup> See more on the city opinion in the case study

<sup>21</sup> For example the City of Johannesburg's Gas License By-Laws

### 3.2.3. Areas of municipal regulation

One of the key areas that municipalities regulate is building regulations, which has an impact on EE. Literature is generally positive about the potential for EE measures based on regulations under this category (SACN, 2013). Apart from authorising buildings, municipalities also regulate other broader processes. These include planning processes such as township establishment, statutory planning through zoning and land-use management schemes. More strategic planning is through IDPs, SDFs and Integrated Transport Plans. Through these, municipalities have considerable power over how development occurs within their municipalities and can better shape it for EE outcomes.

#### **Relevant regulatory framework and literature review**

##### Building regulations

Local government has a mandate to legislate for building regulations. There is also the nationally enacted National Building Regulations and Building Standards Act 103 of 1977 (NBRBSA), which require local government authority for the erection of buildings.<sup>22</sup> Building design and construction has received considerable regulatory attention, for instance through the standards enacted under the NBRBSA SANS 10400-XA: 2011 and SANS 204:2008, covering energy use in buildings. However, **the** regulations are only targeted at new developments and have no effect on existing stock. Although the standards are national, municipalities have the mandate to enforce them through building approval processes.

An important matter regarding these standards is municipal capacity. SANS 10400-XA has created severe capacity shortages that need to be addressed before commencing with implementation (SACN, 2012; SALGA, undated). This, according to literature, has hampered implementation of the standards. The standards also require better alignment with national commitments for climate-change mitigation and adaptation as well as energy-supply constraints.

Besides SANS 10400-XA, national legislation, through the ERA Norms and Standards requires that municipalities implement some of these within their jurisdictions. These regulations require that municipalities ensure the following:<sup>23</sup>

- Installation of SWHs for commercial and industrial building within a certain price and square meters.<sup>24</sup>
- Geysers installed have an insulation blanket.
- Geysers installed have a facility for remote control of the supply of electricity, which were to be implemented by 01 January 2012

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<sup>22</sup> Section 7.

<sup>23</sup> Electricity Regulations for the Prohibition of Certain Practices in the Electricity Supply and Compulsory Norms and Standards for Reticulation Services.

<sup>24</sup> R 750,000 or 300m<sup>2</sup>.

- In respect of space heating, ventilation or cooling in existing buildings, municipalities must install a facility to remotely control the supply of electricity to heating, ventilation and cooling system in its area of supply and link a swimming pool drive and heating system to a facility that enables the licensee to remotely control supply of electricity. Again this was to be in place by 01 January 2012.
- An end user or customer with a monthly consumption of 1000KWh and above must have smart system and be on time of use tariff not later than 01 January 2012.

Not much commentary is available on how municipalities have fared in implementing these national requirements within the set deadlines, but all evidence shows that generally, they have not been implemented. The case study reports expounded on this issue.

Municipalities may also pass by-laws. There are a few that have done so.

**Table 2: Green building and solar water by-laws**

Area of application	Anchoring statute	Major provisions
<b>Green Buildings</b> <b>City of Tshwane – Green Building Development By-Law</b>		
<b>Green buildings construction</b>	<p>Section 7 of the Rationalisation of Local Government Affairs Act, 1998 (Act 10 of 1998)</p> <p>Local Government: Municipal System Act, 2000 (Act 32 of 2000) Section 13</p>	<ul style="list-style-type: none"> <li>• To provide the City of Tshwane with legislative measure to ensure that a more sustainable built environment is developed.</li> <li>• Under Section 3 states that all development requiring CoT approval as defined in the National Building Regulations must comply with the mandatory standards of the City of Tshwane Green Building Development Policy, included in the Schedule.</li> <li>• Such compliance is necessary to obtain building approval and can be used to obtain incentives as detailed in the Cities Green Buildings Policy.</li> <li>• Sanction and failure to meet approval provides sanction as per the NBRBS Act, or penalty or fine, according to Section 4(1)</li> <li>• Applies only to buildings requiring building control approval.</li> <li>• Has both the 'stick' and 'carrot' approach; it provides incentives, such as fast tracked application procedures, reduced application costs, reduced bulk contributions, relaxation of planning requirements, municipal negotiated discounts for energy efficiency and sustainable technologies, tax incentives and green building certification.</li> <li>• Mandatory standards required of the law are: urban heat islands; internal lighting density that complies with SANS 204; requirements for lighting zones; external lighting controls and external lighting power ratio.</li> <li>• Voluntary standards include; internal lighting controls; energy sub-metering; renewable energy for various things such as hand wash basin taps, baths, showers, hot water pipes, rain water harvesting, swimming pools etc. Interestingly, it also provides for requirements for cycle storage and cycle routes, presumably to encourage this activity. It also provides voluntary standards for location of facilities such as places of worship, entertainment, viewing outdoor sport, museums etc. within</li> </ul>

		<p>certain distance of the building.</p> <ul style="list-style-type: none"> <li>The by-law provides specific metrics and submission requirements for the standards</li> </ul>
<p><b>Solar Water Heating (SWH)</b></p> <p><b>Local Municipality of Oudtshoorn – Solar Water Heating by-laws</b></p>		
	<p>Section 11(3)(m) of the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000)</p> <p>Section 156 of the Constitution</p>	<ul style="list-style-type: none"> <li>The purpose is to regulate the incorporation of SWH for hot water in buildings; improve electricity security; reduce use of electricity and create jobs in SWH industry.</li> <li>Applies to all new buildings and all additions to building that require hot water.</li> <li>Does not apply to buildings that are used for industrial purposes and hot water requirements exceed what can be reasonably produced by solar; any privately funded residential building of which the extent is less than 120 m<sup>2</sup>; buildings with heat pump installations as approved.</li> <li>The municipality may also exempt buildings that have permanent shading. Multi-storey buildings should have as much SWH as technically and economically accommodated by the structure and may apply for a notice of exemption for the hot water requirements not able to be served by a solar water heater.</li> <li>According to Section 4, any application for building plan permission must describe the solar water heating systems, including rated outputs in terms of rated daily output according to SANS 6211-1 or SANS 6211-2.</li> <li>The by-law provides for various standards with regard to installation. For example, a domestic SWH system and its sub-components must comply with either SANS 1307 or certified international standards and be installed according to these, and various requirements with regard to performance warranties and post installation checks</li> <li>The by-law provides a requirements on the owner to allow for inspection, and the issuance of compliance notices on contraventions.</li> </ul>

The City of Tshwane’s Green Building Development By-Law is new and there is therefore a need for an analysis on the necessity of its enactment and whether or not its implementation has worked. While some cities initially considered introducing SWH by-laws similar to that of Oudtshoorn, for example Johannesburg, and Cape Town, this has been dropped because of the introduction of SANS 10400-XA.

One regulatory problem hindering some of these measures is the uncertainty of the ability of municipalities to invest in infrastructure that lies within private households. This is especially true for programmes to roll out energy services, such as ceilings, to low-income households or recipients of subsidy houses (National Treasury, 2013). This also includes the problem of maintenance of these installations.

### Spatial planning

Municipalities have the competency to undertake municipal planning under the Constitution. Further, Chapter 5 of the Systems Act requires that each municipal council must, within a prescribed period after the start of its elected term, adopt a single, inclusive and strategic plan for the development of the municipality set out in Section 25 of the IDP. The IDP contains a SDF which sets out objectives that reflect the desired spatial form



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of the municipality.<sup>25</sup> The IDP must inform the municipality's annual budget, which in turn must be based on the development priorities, objectives and performance targets set by the municipality.<sup>26</sup> Section 35 provides that the IDP is the principal strategic planning instrument, which guides and informs all planning and development, and all decisions with regard to planning, management and development, in the municipality. It binds the municipality in the exercise of its executive authority,<sup>27</sup> and also binds all other persons to the extent that those parts of the integrated development plan that impose duties or affect the rights of those persons have been passed as a by-law.

The Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) requires that the national and provincial spheres of government and each municipality must prepare SDFs.<sup>28</sup> SDFs are binding to municipal decision making under Section 22. SPLUMA under the principle of spatial sustainability requires among other things limits to urban sprawl. It also requires in the SDFs, other spatial restructuring elements such as corridors and activity spines. The Act further requires that a municipality must, after public consultation, adopt and approve a single land use scheme for its entire area within five years from the commencement of this Act,<sup>29</sup> which has the force of law, and all land owners and users of land, including a municipality, a state-owned enterprise and organs of state within the municipal must comply to that.<sup>30</sup> Municipal adoption of land use schemes must among others provide for efficient land development.

The legacy of apartheid; planning, sprawling suburbs, townships outside of urban centres, poor integration and poor public transport is inimical to EE. More efficient urban forms also have important implications for the cost of providing municipal infrastructure. Literature suggest that spatial planning instruments are a significant, yet little used pathway to influence changes at city-level EE. They also support a fine mesh of municipal legislative and quasi legislative action such as the creation of zoning schemes, township formation and the creation of by-laws to enforce these. They are also buttressed, through the IDP, by budgets. SALGA in the Local Government Energy Efficiency and Renewable Energy Strategy notes that local government should focus on planning approvals to create more energy efficient ways of city development.

The second draft of the National Energy Efficiency Strategy mentions the need by local government to permit commercial development closer to residential development, promote compact urban forms and the integration of job opportunities with living areas. Other literature provides that development should be steered towards walking and cycling option, mixed use development and in-fill development.

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<sup>25</sup> Local Government Municipal Systems Act 32 of 2000 Local Government Municipal Planning and Performance Management Regulations 2001 (Municipal Planning regulations) Regulation 2(4) GN R796 in *Government Gazette* 22605 of 24 August 2001.

<sup>26</sup> Regulation 6(a) Municipal Planning Regulations

<sup>27</sup> Except to the extent of any inconsistency between a municipality's integrated development plan and national or provincial legislation, in which case such legislation prevails.

<sup>28</sup> Section 12.

<sup>29</sup> Section 24.

<sup>30</sup> Section 26.

The Tshwane Green Building Development By-Law also provides for requirements for cycle storage and cycle routes, and sets voluntary standards for location for facilities such as places of worship, entertainment, viewing outdoor sport and museums within certain distances of a new development.

Literature also hones in on developing public transport as key pathway for influencing city-level EE for residents.

Currently, there is reinforcement of car-ownership and only just emerging support for alternative modes such as public transport or non-motorised transport. Local government is also called upon to provide better traffic management,<sup>31</sup> and travel demand management.<sup>32</sup>

Without exception, city SDFs pay homage to many of these spatial restructuring measures.

**Table 3: Examples of EE related measures in city SDFs**

City	Key spatial planning concepts
Buffalo City	<p>The key spatial restructuring elements in Buffalo City are:</p> <ul style="list-style-type: none"> <li>• Nodes</li> <li>• Corridors</li> <li>• Urban Edge</li> <li>• Open Space System (OSS)</li> <li>• Densification/Residential Intensification</li> <li>• Mixed Uses.</li> </ul>
Nelson Mandela Bay	<p>The MSDF has three main focus areas:</p> <ul style="list-style-type: none"> <li>• Sustainability and the restructuring of the city, through among others, accessibility (public transport and pedestrian focus, mixed use development, corridor development, densification and reducing urban sprawl).</li> <li>• Corridors and accessibility</li> <li>• Economic development and growth, which among others includes among others instituting an urban edge and urban growth boundary, activity nodes or areas, infill development priority areas and social housing, metropolitan open system and transportation.</li> </ul>
City of Tshwane	<p>The spatial policy in the MSDF is based on among others:</p> <ul style="list-style-type: none"> <li>• Compaction and densification</li> <li>• Promotion of the green economy through spatial planning</li> <li>• Nodes and activity areas</li> <li>• Urban edge and growth management boundary</li> </ul>

<sup>31</sup> Largely technical measures recommended are optimisation of traffic controller settings, urban traffic control systems etc.,

<sup>32</sup> The measures for this include ride sharing, tele-commuting, park and ride etc.

	<ul style="list-style-type: none"> <li>• Movement and connectivity.</li> </ul>
Ekurhuleni Metropolitan Municipality	<p>The SDF approach is framed around inter alia:</p> <ul style="list-style-type: none"> <li>• Promoting economic activity within the core development triangle</li> <li>• Specialised activity nodes within and beyond the core development triangle</li> <li>• Optimise linkages within the core development triangle and link disadvantaged communities to the within the core development triangle</li> <li>• Mixed use, high density development along corridors and at nodes</li> <li>• Structure the IRPTN to support corridors</li> <li>• Promote infill residential development</li> <li>• Implement a statutory urban edge.</li> </ul>
eThekweni	<p>eThekweni's SDF conceptual framework is guided by:</p> <ul style="list-style-type: none"> <li>• An urban core, the urban centre, which generally has servicing capacity and thus opportunity for densification and can support thresholds for a range of services, industry and public transport</li> <li>• An Urban Development Line concept used not only to demarcate the extent to which urban development will be permitted to establish within the metropolitan area in the long term, but more specifically to promote a more convenient, compact, efficient, equitable and sustainable settlement form.</li> <li>• Identifying the following key intervention areas: <ul style="list-style-type: none"> <li>- that need to be protected</li> <li>- of need where integration and restructuring is needed</li> <li>- where economic growth and investment will be pursued, and those where social investment will take preference</li> <li>- where infill, densification and urban renewal should be pursued</li> <li>- of new growth areas and areas for future development</li> <li>- Identifying hierarchy and nature of roads, development corridors and nodes; and</li> <li>- with existing infrastructure capacity to support integration, densification, as a way of ensuring sustainable development.</li> </ul> </li> </ul>

South Africa is still sitting with the legacy of the apartheid spatial form, an issue acknowledged in recent policy documents such as the National Development Plan and the Draft Integrated Urban Development Framework.<sup>33</sup> There are no regulatory silver bullets to resolve this and it is not solely within the scope of a study on EE. Literature, for example suggests the use of zoning schemes to incentivise densification along public transport routes has been useful, although there is little authoritative writing on how this has worked,

<sup>33</sup> See for example Department of Cooperative Governance and Traditional Affairs (2013) Integrated Urban Development Framework; The Presidency, National Development Plan (2013)

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especially along Johannesburg's and Cape Town's bus routes. There are calls in the Local Government EE and RE Strategy to support the process of developing a 'single land use planning system' (SALGA, undated: 43) with reference to the SPLUMA roll out of land use management systems and related by-laws. It is not clear what EE specific supportive measures should be included. The City of Cape Town has developed a draft by-law under SPLUMA, and it will be useful to determine if it has provisions that support the city's EE vision, such as a requirement to place efficiency measures in zoning schemes. There are no by-laws at a local level dealing with public transport besides the common ones regulating public transport primarily the taxi industry for health, safety and nuisance issues.<sup>34</sup>

Although some literature emphasises the importance of spatial planning to EE, it seems the issue does not get much attention at a municipal level. The areas of emphasis for deliberate action in EE largely seem to be the realm of electricity provision. This means that the current wide ranging interventions under spatial planning are all not specific to EE and are not looked at particularly through EE lenses. There is need to further investigate why this is the case.

#### **Infrastructure provided by the municipality**

Municipalities have a role in basic engineering, construction and maintenance of municipal infrastructure and grids for water services reticulation. These include roads, water and sewage, and electricity. A critical challenge regarding municipal infrastructure has been its deterioration because of lack of sufficient maintenance. This has affected the efficiency of the service. The State of City Finances Report (SACN 2013) states that capital budgets over the past 12 years have been biased towards service extensions, which has affected maintenance levels. According to the publication, SACN member cities require a significant increase - more than triple their current capital budgets - to adequately grow the infrastructure, extend services to the poor as well as maintain and renew it.

The current poor and inefficient urban forms have a bearing on infrastructure costs. Further, a lifecycle approach to infrastructure costing is necessary to better understand and incorporate EE benefits.

#### **Relevant regulatory framework and literature review**

Distribution of electricity is shared between municipalities and Eskom, with the former licensed to carry out the task under ERA. Municipalities have a duty to ensure sustainable reticulation services through effective and efficient management and adherence to the national norms and standards.<sup>35</sup> The current norms and standards have been covered in section 3.2.1 of this review. Others include infrastructure standards by Eskom (SANS 10098).

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<sup>34</sup> See for example City of Cape Town Traffic By-Law

<sup>35</sup> Section 27(f).

Under Schedule 4B, a municipality has competency to provide water and sanitation. There are a number of by-laws that have been enacted dealing specifically with protecting municipal water and sanitation infrastructure, as well as setting standards for private infrastructure connecting to it.

**Table 4: Water and Sanitation By-Law for Nelson Mandela Metropolitan Council**

Water and sanitation	Water Services Act, 108 of 1997 Sections 3(1) and 21 of	
<b>Nelson Mandela Bay Metropolitan Municipality Water and Sanitation Services By-Law</b>	Sections 27(1)(b), 152(1)(b) and 156 of the Constitution of the Republic of South Africa, 1996	<ul style="list-style-type: none"> <li>• The by-law deals with protecting municipal water supply and sewerage systems (from trespassing, obstruction, pollution, etc.); requirements regarding connection to the water supply system including methods of installation; right to impose water restrictions including right to surcharge, as well as restrictions over the use of certain appliances; right to disconnect supply; metering including how it should be done.</li> <li>• An important area of control is the approval of connection work by the municipality including requiring qualified plumbers as per SANS standards, technical requirements on drawings detailing all aspects of water use; quality of components to be used and their performance criteria according to SABS standards; design criteria for water installations including for hot water heaters and hot water distributions systems; adherence to SABS standards with regard to a multitude of other requirements including water storage tanks, isolating valves, installation of pipes, flushing, car washes, grey water.</li> <li>• The by-law also requires the protection of the water supply system from pollution by preventing backflow from individual premises.</li> <li>• Licensing the use of water from other sources including boreholes including providing conditions.</li> <li>• Sewerage system including application for connection, discharge of sewage stronger than domestic sewage; sewage connections; septic tank and standard thereof.</li> <li>• Where there is a provision that states that in case of a difference between the requirements of SABS 0252-1 and the by-law, the latter prevails.</li> </ul>

The Nelson Mandela Bay Metropolitan Municipality Water and Sanitation Services By-Law shows that there is a limited provision for EE based on some of its provisions. Literature suggests that with regards to water and sanitation provision, far greater efficiency gains are possible through EE water and sewerage pumps and there is also potential for micro-hydro in potable water systems. Lack of funding is cited as a problem.

There are multiple industry wide standards requirements regarding the laying of infrastructure such as roads, water and sewer reticulation. These are established at national level through SABS and will not be detailed here. Adherence to these is vital in all municipal infrastructure projects.

### 3.3 Other areas of regulatory concern

#### 3.3.1. Public finance regulations

There is an inherent tension between providing a service in the most efficient and effective manner and ensuring financial and procedural probity. In some instances, this tension deters the implementation of innovative partnerships that have the potential to leverage capacity and capital for EE. The problem is often framed as one of the dilatory effect caused by the strict adherence to procurement laws required of local government, which negatively affects EE implementation. The regulatory processes are deemed to be onerous, the short term cash flow management and budgeting cycle too short at three years, public participation process are expensive and devoid of life cycle costing not implemented meaning the benefits of green projects are underestimated.

Specific issues include:

- The tedious process of granting rights of use or disposal of municipal assets. It often happens that EE and related projects require given service provider rights of use over municipal property.<sup>36</sup> This contributes to the difficulty in, for example, promoting 'land fill gas to electricity' projects.
- Uncertainty in the municipality investing public infrastructure on private property often linked to thermal efficiency retrofits in low income households.
- The cumbersome, expensive and onerous nature of entering into Public Private Partnerships (De Visser, 2012).

There are counter arguments that, in fact many of these regulatory problems emerge from poor or conservative interpretation of laws. The culture has incentivised a conservative and risk-averse ways of interpreting laws in municipalities. Supply chain management favours the selection of established technologies, large scale projects whose inputs can be specific and quantified from the outset. Performance management does not reward calculated risk taking (National Treasury et al, 2013)

Some recommendations have emerged from literature as follows:

- Firstly, intergovernmental processes of regulatory clarification should continue with NERSA, for instance, to clarify the regulatory situation regarding small-scale embedded generators.
- Secondly, changing the performance management system to be more EE friendly. For example, the ERA under Section 29 requires that after consultation with the Minister of Energy, NERSA must prescribe general key performance indicators (KPIs) in respect of the 'technical operational issues' pertaining to reticulation systems for municipalities. These must then be included in the KPIs under

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<sup>36</sup> The example given is often that of a landfill site, for extraction of methane gas.

the Systems Act.<sup>37</sup> Such technical operational issues can include those related to EE measures. A publication from the National Treasury (2013), states that:

*A favourable policy and regulatory framework with mandatory energy efficiency targets can create demand for energy audits and energy efficiency investments and raise the awareness of energy efficiency measures, lowering investment risks and thus allow for ESCO market development.*

The performance management system is key to driving behaviour of executives, but has not been geared towards the crafting of targets under EE and other related initiatives. KPIs are usually related to the provision of basic services, which has greater political support and is more defensible for senior managers. EE projects often do not always show immediate and sellable benefit politically.

- Thirdly, lobbying for measures to simplify the processes, reduce duplication without affecting the objectives of the legislation or have a 'green procurement policy' that is cognisant of the specific needs of the industry (National Treasury et al, 2013)
- Finally, dissemination of more progressive interpretation of legislation. From the case studies, there is need to analyse how cities are practically dealing with this issue.

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<sup>37</sup> The Local Government Municipal Planning and Performance Management Regulations require the adoption of a municipal performance management system and setting up of KPIs. A number of minimal KPIs have been provided for under the regulations, and they include the percentage of households with access to basic services, proportion of capital budget spent on capital projects, jobs created under local economic development initiatives and the financial viability of the municipality.

## 4. Contextualising Regulatory Measures

Regulations are only as effective as the regulator. Greater energy efficiency can only be achieved if the entire system is functional. The SALGA strategy document notes, ‘The experience of those who have pioneered implementation at the local level cannot simply be added on to municipal business, but requires that capacity, systems, service delivery and revenue models be addressed.’ (SALGA, undated: 3)

These broader issues must always be kept in mind when considering regulatory interventions.

### 4.1 The cost of compliance

In reality, a municipality may not be incentivised to implement many of these regulatory measures. This is because consumption of services constitutes a substantial part of its revenue. According to the State of City Finances Report (2013: 28), electricity revenues constitute over 30% of operational revenues of cities. Electricity is also an important lever to collect other charges and taxes that may be owed to the municipality. On the one hand, the report notes that greater EE means reducing household bills and costs of electricity to commercial and industrial consumers, introducing important economic efficiencies into urban systems. This improves the affordability of municipal services and feeds back to municipalities through less bad debt and improved business environments. However, there are also some major disincentives. This is the negative shorter term financial impact on the municipality or utility, preventing it from implementing a strategy that in essence reduces the consumption of paying customers. Without any adjustment of the tariff to such customers, income to the municipality will reduce, which may threaten the economic viability of the entity providing the service and the municipality as a whole. Further, a question arises on whether capital costs on the municipal side are related to infrastructure improvements on infrastructure such as metering systems. Operationally there are costs associated with consumer awareness campaigns and inspections related to regulatory interventions (SACN, 2013). There has been some fiscal intervention, especially targeting the initial capital outlays for EE measures at a municipal level for example, the Municipal EEDSM programme.

From a household perspective, the initial capital outlay is also a hindrance to greater EE uptake. Section 12L of the Income Tax Act provides an incentive for EE savings in the private sector. The regulations provide that a person can claim an allowance for EE savings and to do this, the person needs to be registered with the South African National Energy Development Institute, appoint a measurement and verification professional to compile a report containing the computation of the energy efficiency savings and submit the report and obtain a certificate from the organisation. This certificate is used to obtain a tax deduction using a rate in the Act.

The efficacy of these measures will be examined at a municipal level in the *Gaps and Opportunities Report: Regulatory Framework to Promote Energy Efficiency in Municipalities* which is the next deliverable of this project. However, it is interesting to note that some literature suggest that what has more successfully changed the supply of residential and commercial property, to be more EE compliant is not regulations, but



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the rise in re-current household costs. This, for example, has ensured that frills such as swimming pools and garages are becoming fewer and fewer in new houses being built (FNB, 2013).

## 4.2. Effects on the poor

One important aspect of EE debate are the social dimensions, particularly with regards to poorer citizens. The regulatory principle is that a municipality has a duty to provide basic services free of charge or at a minimum cost to certain classes of end users within its available resources.<sup>38</sup> According to literature, specific efficiency measures in low income households (particularly efficient water heating, ceilings and insulation, lighting and efficient cooking technologies) provide major health, lifestyle and safety benefits. Although there is a small argument for ‘suppressed demand’ and ‘energy efficiency gains’ the rationale for provision of energy services is largely social.

Currently, the requirements in terms SANS 10400 are applicable to public subsidised housing and the subsidy quantum has been increased to assist with this.<sup>39</sup> This is a relatively recent enhancement, and its implementation has not been examined in literature. The regulations apply to all housing including affordable or “gap” housing, which has little recourse to government subsidies.<sup>40</sup> There is limited commentary of its effects on this housing market segment.

## 4.3. The need for conducive internal institutional arrangements

There is fair mention of institutional arrangements and ‘championing’ of EE within municipal managers’ offices (SALGA, undated: 9). It is also about institutional coordination, training, marketing and creating platform of inter-sphere coordination. ‘The creation of an energy unit’ is likewise mentioned in some literature (SALGA, undated: 10). There has been some progress with this, particularly with the latter, where special units have been created, although this is largely with regard to implementation of EE for the municipalities own facilities.

## 4.4. Developing monitoring and evaluation systems

Monitoring and evaluation systems are an important aspect of EE implementation. Literature calls for streamlining of national data and reporting requirements through the IDPs, NERSA, Eskom, Department of Energy and Department Environmental Affairs. The legislative platform for this are the regulations for the mandatory provision of energy data under the National Energy Act. These identify a whole range of providers of data, including organs of state such as municipalities. The regulations require that these institutions and organisations collate and provide data upon a written request by the relevant department.

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<sup>38</sup> For example Section 27 of the Electricity Regulation Act

<sup>39</sup> SALGA for example requires that this is done to all houses post April 2014

<sup>40</sup> Outside the limited FLISP subsidy.

## 4.5 Developing skills and capacity

Regulatory interventions need to be made with the understanding that capacity and skills need to be built up. A law is only as good as its implementation results. A whole range of recommendations emerge in this category such as training courses, capacity development programmes and knowledge sharing platforms; addressing technical staff shortages in municipalities including failures of Sector Training Agencies; bursary schemes and artisanal training.<sup>41</sup> With the development of skills and capacity comes the importance of differentiation between municipalities in recommending regulatory interventions.

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<sup>41</sup> See for example SALGA (undated) p. 11

## 5. Conclusion

The intention of this report is to broadly survey existing literature and the current status quo of laws and regulations on EE and determine the important issue for greater examination going forward. The report is not meant to come up with firm conclusions and recommendations on questions of EE and the regulations that frame it.

It is clear that there are already numerous instruments with legal clout that can be used to ensure EE measures are complied with.

In terms of the municipalities own operations, the legal nature of the IDP means that it can be used to entrench EE action within municipalities. Its link to capital budgets further assists in ensuring implementation. Through this, the municipalities can take leadership with regard to already existing and binding standards set at national level regarding its assets such as SANS 10400-XA and norms and standards created under the ERA. It can also further introduce its own by-laws on areas of omission.

There have been additional regulations and by-laws largely around green buildings and there is need to determine the practices emerging out of these new regulations.

The review has noted that often the challenges relating to the implementation of EE measures are regulatory and not of a lack of regulations. The inherent conservativeness around regulatory interpretation has been cited as a problem in the current environment where municipal managers are measured on service delivery not innovation or calculated risk taking. One important issue identified from the literature is the need to build capacity and disseminate what has been considerable writing and legal opinion that supports contrary interpretations. In addition, there is need to advise on other matters such as misconceptions on regulatory powers and functions of municipalities regarding EE. Further, without political support and championing at a municipal level, EE will remain at the periphery of municipal operations.

There are regulatory systems to support more innovative EE based performance management system measures for example, and these need to find champions for their introduction.

The other side to regulatory interventions is the ability to enforce them. There is legislation around EE currently at national and local level that is not being implemented. Of specific note are the Norms and Standards under ERA. It would be interesting to determine why this is so, and whether the problem lies with the regulations, or is related to other factors.

Apart from regulatory issues affecting EE, there are also non-regulatory issues. A crucial aspect of EE relating to infrastructure built and owned by municipalities is maintenance. Inadequate maintenance of infrastructure at municipal level has resulted in major maintenance backlogs.

The spread of regulatory mandates across spheres of government means that good intergovernmental relations are key. These can be used to lobby for appropriate EE based regulatory procurement frameworks,

as well as clarify other issues around the municipal public finance regulations including the ability of municipalities to install thermal efficiency technologies, such as ceilings and other insulation, into private property. These forums can be used to disseminate knowledge on how municipalities, especially those with by-laws, are tackling this issue. Some relatively successful forums include vNAMA, which integrates national, provincial and municipal initiatives around EE for public buildings.

One complex issue, but intricately tied to EE is transforming urban forms in the country. Despite using instruments such as SDFs and linked zoning schemes which have legal teeth, this is yet to happen in a meaningful way. There are regulatory responses and ways of beginning to address this issue. However, it does seem these have not been sufficient to fundamentally transform urban spaces. From the literature, it seems that municipalities have also not emphasised spatial form to create greater EE.

Regulatory interventions need to be cognisant of some important contextual factors. There are built-in disincentives for municipalities to regulate for EE. These are based on real or perceived notions of the cost of these interventions and threats to revenue sustainability. Regulation has to be accompanied by education. It is also not clear how much the regulations impact affordable housing development. It would be beneficial to determine if the increase in subsidy quantum for RDP houses sufficiently caters for the EE enhancements to the house.

There is a significant window of opportunity for learning, given the roll out of new regulatory instruments dealing with EE at municipal level. These include green building by-laws, as well as by-laws relating to the new SPLUMA and their influence on energy efficiency. Useful sharing on the processes of by-law formulation, implementation and monitoring should be done and the SACN is well poised to champion this cause.

Finally, many EE driven legislative frameworks are highly technical and require specialised capacity to implement them. This is not always available at municipal level. Another important contextual matter, beyond the realm of this project is linking regulatory mandates with intergovernmental fiscal flows. This is key as regulatory responses have to be preceded by an understanding of the institutional fiscal responsibilities.

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