**RESOURCE DOCUMENT: ANNEXURE C**
**to Guidance Note 5**

# M5 Business and Investment Plan: Best Practice Guideline

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Prepared by National Treasury's Cities Support Programme

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**Definitions**

| | |
|---|---|
| AMS | An asset management strategy is a comprehensive plan and approach for how the utility business acquires, operate, maintains, and disposes of its assets to achieve its business goals |
| Business Plan | The term Business Plan refers to the Business and Investment Plan that is required in terms of Minimum Commitment M5 |
| EUM | Effective Utility Management. See Resources (Section 10) |
| ERA | Energy Regulatory Act of 2025 as amended |
| CRC | Current Replacement cost |
| DET | Distribution Energy Trading is the process and mechanisms that allow for the exchange of electricity between various participants and consumers (prosumers) within a local distribution grid. |
| DER | Distribution Energy Resources refers to the various small-scale electricity generation and storage systems, like rooftop solar panels, home batteries, or electric vehicles, that are located near the end user and de facto changing the current one-way energy flow business to a bi-directional energy flow regime. |
| DRC | Depreciated replacement cost of assets |
| DUOS | Distribution Use of System Charges |
| IPP's | Independent Power Producers |
| Minimum Commitments | Accountability Performance Minimum commitments as defined in National Treasury MTSR Guidance Note 4 |
| Service compact | Defines the relationship between the Service Authority and the Service Provider, with clearly defined division of responsibilities across value chains for service authority to service provider with clear performance and accounting metrics, including the financial relationship between the two. See Guidance Note 4. |
| Service level agreement | Service level agreements define the terms and conditions of providing services by the municipality on behalf of the trading service, (and vice versa but excluding those core services defined in Section 4 of this document).<br>The Service Compact is not a service level agreement.<br>Service level agreements will generally apply to ancillary services such as legal services. |
| OT | Operational technologies refers to hardware and software that monitor, control, and automate the physical processes of distributing services of the energy and/ or water utility services. It includes Supervisory Control and Data Acquisition (SCADA) systems, Distributed Control Systems (DCS) and CMS( Customer Management Systems) etc |

| | |
|---|---|
| Tariffs | Tariffs refer to all forms of service-related sources of revenue including charges like connection charges and developer contributions. |
| Utility | Refers to the management entity responsible for the provision of the water, electricity and/or solid waste trading service. In the context of the Metro Trading Services reforms this is either a business unit or a municipal-owned company/state-owned company (SOC)/municipal entity.<br><br>**Legal Framework:** Municipal entities are established in terms of the Local Government: Municipal Systems Act, 2000. Many are also registered as companies under the Companies Act, 2008 and use the "SOC Ltd" designation to signify that they are state-owned.<br><br>**Ownership and Governance:** A municipal entity that is an SOC is wholly owned by the relevant municipality (the "parent municipality"). It operates autonomously to a certain extent but must still comply with legislation like the Municipal Finance Management Act, 2003 (MFMA) and the Municipal Systems Act.<br><br>**Function:** These entities typically provide essential public services such as electricity, water, sanitation, and transport, functions that would otherwise be performed directly by the municipality. |
| Water Services | Refers to water and sanitation services unless the context dictates otherwise |

# 1 Introduction

## 1.1 Purpose

The Service Compact states that the trading service business plan must advance best practice utility management practices and benchmarks. A well-performing utility can be characterized as a business permanently providing services to all customers in full compliance with the applicable quality standards (both for service supply and commercial services), and efficiently carrying out operations in all business areas within a framework of financial sustainability. Therefore, the assessment of the performance of a utility needs to include both operational and financial aspects.

This document offers best practices as a guideline for the development of a Business Plan for the water and sanitation, and electricity and energy, trading services. Over and above the minimum content included in Annexure B, the best practice Business Plan guideline follows the same structure but covers the business turnaround in much more detail, including further resource and reference material which provide for best practice utility management.

It should be read together with the following companion documents:

- Guidance Note 5, Annexure B: M5 Business and Investment Plan: minimum content template.
- Guidance Note 1, Annexure A: *Resource document: Developing and implementing municipal water and sanitation business turnaround strategies*
- Guidance Note 2, Annexure B*: Resource document: Developing and implementing municipal electricity and energy business turnaround strategies*

The document draws primarily on the following references.

- Effective Utility Management: A Primer for Water and Wastewater Utilities (AWWA, 2017), referred to as EUM in the rest of this document, and equally relevant for electricity utilities;
- Improving the Performance of Electricity and Water and Sanitation Utilities in Sub-Saharan Africa (World Bank, 2016);
- Reducing technical and non-technical losses in the power sector. Washington, DC. (World Bank, 2009).

The document also considers the implications of a changing energy market with reference to the following four references:

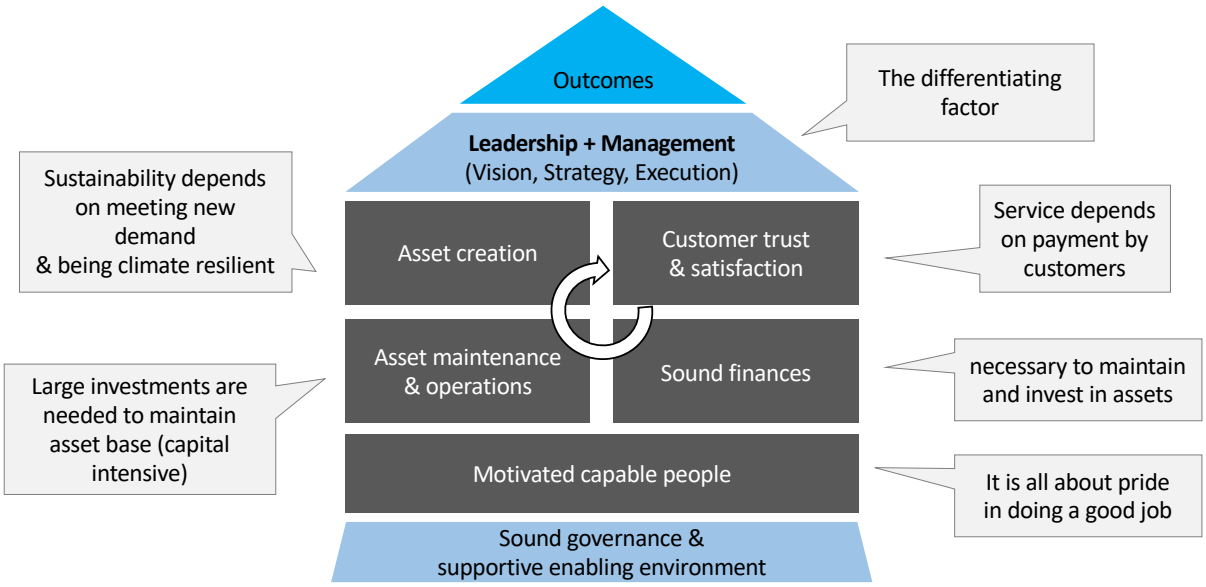
- Innovation landscape for a renewable-powered future: Solutions to integrate variable renewables. International Renewable Energy Agency, Abu Dhabi. IRENA (2019).
- Business Models and the Energy Transition (Mouritz et al, 2022).
- Critical Link: Empowering Utilities for Energy Transition (World Bank)
- Electricity Pricing and sector reform: A summary of key concepts and strategic Questions Technical report. SEA for Presidential Climate Commission; September 2025

Further resources are offered in Section 10.

## 1.2 Structure of this document

The document uses the framework of the 7-box model for effective utility management and follows the structure of the minimum content requirements set out in GN5 Annexure 2: Business and Investment Plan minimum content template.

*Figure 1: 7-box model for effective utility management*




Note: The box labeled "Customer trust and satisfaction" can be referred to as Customer Services or Commercial Services (or both). The term Retail Services is more commonly used for electricity, and Customer Services for water.

# 2 Understanding changes in context

*Best practice:* Every trading service should periodically undertake a review of the external environment within which it operates. There are standard tools to assist with these processes such as:

- PESTEL (Political, Economic, Social, Technological, Environmental, and Legal factor analysis)
- SWOT (strengths, weaknesses, opportunities and threats analysis)

For all trading services, this analysis should consider at least the following

- Impact of upcoming local government elections on the business
- Managing a trading service in the context of unstable coalition governments
- Changes to the governance environment (governed by the service compact)
- Impact of lawlessness on the business
- The challenges of operating in a context of low economic growth
- Changes in macro-economic conditions affecting investment and funding decisions
- Any changes to policies, legislation, regulations affecting the business

The performance of electricity utilities is anchored on three key and interlinked components:

- Security and efficiency of supply correspond to the upstream activities to ensure security of supply at least possible cost,

- Efficient operational and commercial performance of the electricity utility corresponds to (i) distribution system planning, (ii) commercial management systems; (iii) operation and maintenance systems and practices, (iv) corporate governance and management of organisational resources, and (v) implementing other capital investments,
- Sustainable financial performance of the electricity utility corresponds to (i) tariff methodologies determining required revenues, (ii) financial planning, and (iii) management of subsidies and social protection mechanisms for vulnerable consumers.

Thus, for electricity, this analysis should specifically address the following, among other factors:

- Changing external market conditions for selling electricity, in particular the changing mix of energy sources, a two-way-energy flow with increasing levels of renewable energy, storage and the growth of embedded (distributed) generation (see IRENA, 2019);
- Innovations and developments in technologies related to generation, storage, operational and information technologies, systems to manage dynamic energy markets etc. (see IRENA, 2019);
- Changing business models for managing the distribution grid in this context (See Mouritz et al, 2022) and
- The changing market model as envisaged by ERA and the planned establishment of a market for wholesale electricity in 2026 and the emerging creation of retail business practices in the distribution part of the ESI value chain

For water services, this analysis should specifically address the following, among other factors:

- Proposed changes in legislation through the Draft National Water Amendment Bill and Draft Water Services Amendment Bill (published in November 2023). Relevance includes institutional reforms to improve management of water services such as the DWS regulations on licensing of water service provider (WSP);
- Impact of climate change and changes in water security outlook (risks of water supply adequacy), and implications for the investment priorities. See Water Europe (2025) and Cape Town Water Strategy (2019);
- Changes in water resources management (for example, changes in national policies, water resource institutions and/or water resources projects); and,
- Changes in technology and costs affecting investment choices.

# 3 Leadership and management

## 3.1 Leading organisational change and improvement

*Best practice:* “Leadership is critical to effective utility management, particularly in the context of driving and inspiring change within an organization. Leadership refers both to individuals who can be effective champions for improvement, and to teams that provide resilient, day-to-day management continuity and direction. Effective leadership ensures that the utility’s direction is understood, embraced, and followed on an ongoing basis throughout the management cycle. Leadership has an important responsibility to communicate with the utility’s stakeholders and customers. It further reflects a commitment to organizational excellence, leading by example to establish and reinforce an organizational culture that embraces positive change and strives for continual improvement. Organizational improvement efforts require commitment from the utility’s leadership.” (Adapted from EUM)

Every metro should seek to establish a leadership and management team for each trading service, supporting the SPoMA with technical and business management competencies, that has the following attributes:

- Champions improvement and drives change within the organization
- Provides day-to-day management continuity and direction
- Ensures clarity and alignment in the utility's direction throughout the management cycle
- Communicates effectively with stakeholders and customers
- Demonstrates commitment to organizational excellence and leads by example
- Reinforces an organizational culture of positive change and continual improvement

## 3.2 Strategic goals

Strategic goals define a utility's direction of travel (where it wants to go). They can create organisational coherence and effectiveness when both investment and operational decisions are always considered in the light of these medium and long term goals.

*Best practice:* It is anticipated that the strategic goals of both water and electricity providers in South Africa's metros would address some or all the following attributes of effective utility management, linked to the 7-box model.

*Table 1: Attributes and strategic goals for effective water and electricity trading services*

| Attribute | Water services | Electricity services |
|---|---|---|
| **Service outcomes, overall sustainability and risk management** | | |
| **Product quality, including service reliability** | Consistent delivery of safe, high-quality drinking water that meets regulatory standards and customer expectations. Safe collection of human waste. | Reliable electricity supply with minimal outages, voltage stability, and compliance with safety, grid and reliability codes. Nature is an asset centric service within a license (regulatory) environment. |
| **Community sustainability** | Universal access, sustainable water abstraction, and social value creation. | Renewable integration, decarbonization, decentralisation and equitable universal energy access. |
| **Resource sustainability** | Water security, conservation of water sources and use, energy efficiency in treatment and conveyance, compliance with effluent standards, catchment protection | Smart-grid management and use of clean energy resources to minimize environmental impact. |
| **Enterprise resilience** | Risk and continuity planning for droughts, floods, or supply interruptions. | Cybersecurity, storm resilience, and recovery planning for grid failures, energy security and system shocks. |
| **Customer service and stakeholder management** | | |
| **Customer satisfaction** | Transparent accurate billing (and vending of electricity), online smart services, quick response to service issues, proactive communication during disruptions. Strong customer engagement programs.<br>Annual customer satisfaction survey, customer service charter and a service level standards document. | |
| **Stakeholder understanding and support** | Transparency with regulators, municipalities, and citizens through reporting and community engagement. | Multi-stakeholder partnerships with regulators, consumers, DER providers, traders and local governments to support energy transition. |

| | | |
|---|---|---|
| **Finances** | | |
| **Financial viability** | Cost-reflective tariffs, sound capital planning, and sustainable revenue collection. | Cost-reflective tariff structures, investment in asset modernization, appropriate operational technologies and financial resilience against a DET arrangement, with cost fluctuations. |
| **Asset management, investment and operations** | | |
| **Operational Optimization** | Energy-efficient pumping, leakage reduction, and automation of plant operations. | Grid monitoring, smart meters, and distribution system optimization to minimize Technical and non-technical losses. |
| **Asset management** | Asset management plans that balance performance, risk, and lifecycle costs. | A distribution Asset Management Strategy that includes a systematic approach to manage the entire lifecycle of the distribution assets. It also includes master planning for the utility business looking forward at reinforcement and network expansions. |
| **Human resources** | | |
| **Employee and leadership development** | Skilled, safety-conscious, motivated and productive workforce with technical, managerial, and adaptive capacity. | |

Source: Adapted from EUM.

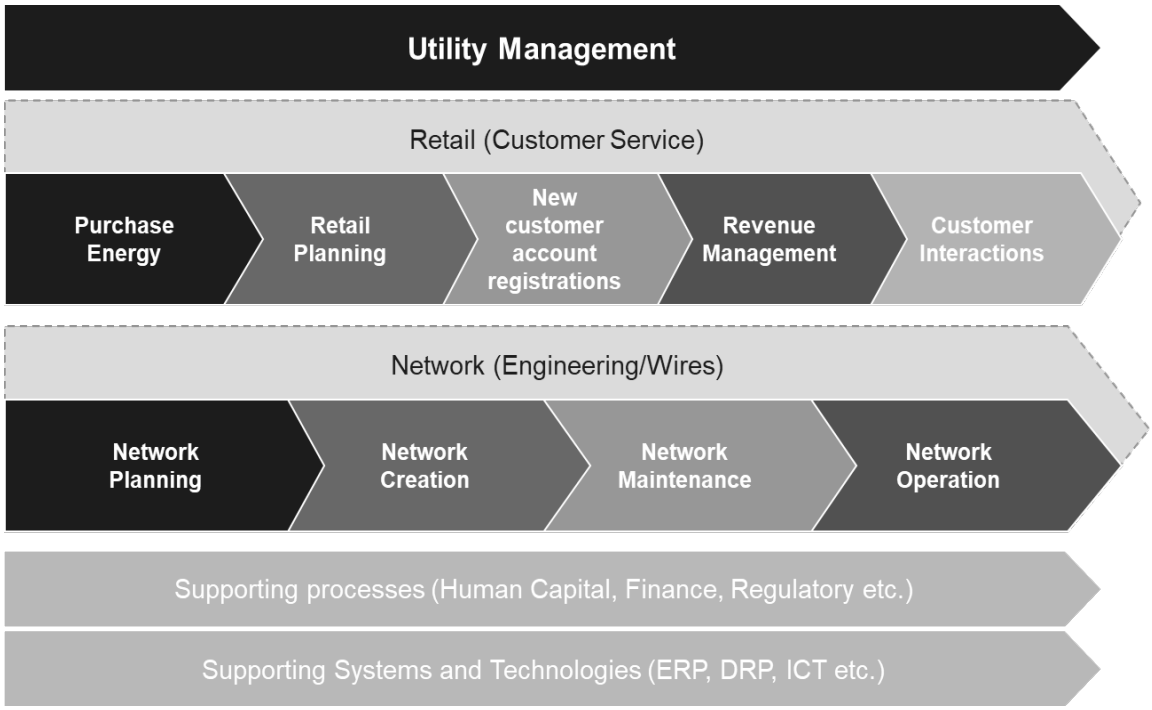
Ideally, the strategic goals should be reasonably stable over time and not change often. Nevertheless every metro should periodically review their strategic goals.

## 3.3 Holistic approach to utility management

As stated in the strategy resource document referenced in Section 1, providing effective trading services is not just a technical function. All of the functions necessary to manage an effective trading service need to be addressed; this includes customer/commercial services (communications, metering etc.), financial performance (including billing/vending, credit control etc), human resources (ensuring staff capability and performance), support services (procurement, contract management, OT and IT, fleet management etc.) as well as the more ‘technical’ aspects of the business (planning, asset creation, asset management, operations and maintenance etc.). These must be integrated with the utility’s operational value chain.

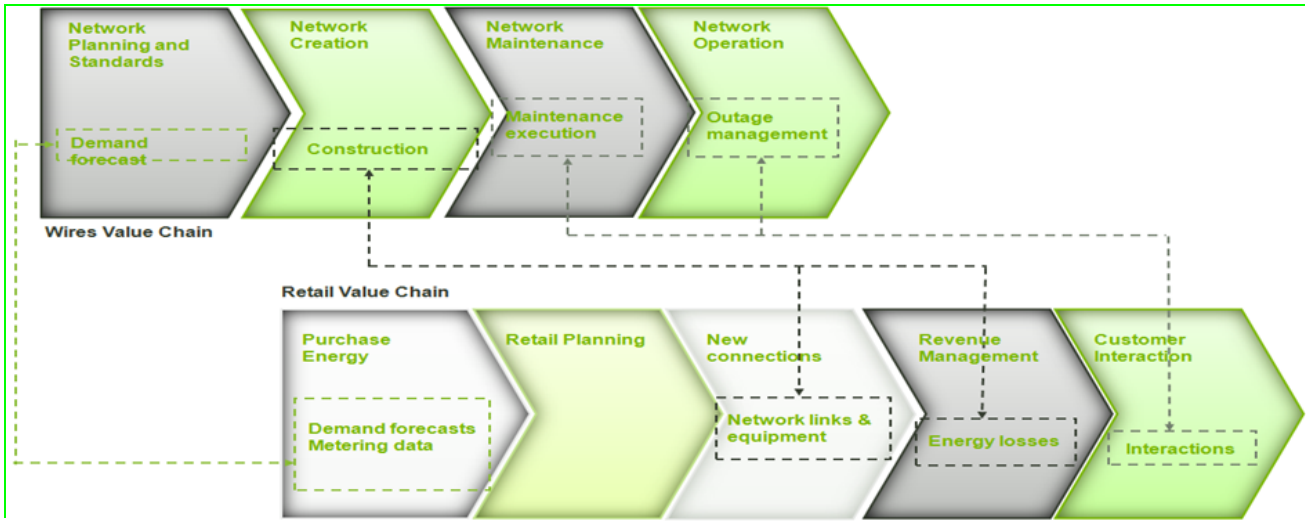
For example, the functional areas for an electricity distribution business are shown in Figure 2.

*Figure 2: Holistic approach to Utility Management (example for electricity)*[1]




A symbiotic relationship exists between wires and retail in order to deliver an integrated service. This must be considered in the way the business is structured and processes mapped. Figure 3 provides some insights into how these elements of the value chain have an influence on each other (example for electricity).

*Figure 3: Wires and Retail relationship*[2]




[1] Source: www.sagen.org.za/all-publications/197-an-updated-assessment-on-the-status-quo-and-current- performance-of-the-south-african-edi?category_access=1

[2] Adapted from the EDIH Blueprint

## 3.4 Organisational design

The purpose of organisational design is to effectively support the achievement of the organisation's strategic goals. That is, an organisation's design must be aligned with its strategy if it is serious about achieving its strategic goals.[3]

*Figure 4: An organisation's design must be aligned with its strategy to achieve it strategic goals[4]*

Organisational design considers the structures, processes and systems, people and culture, and technology that will most effectively achieve the organisation's strategic goals.

The organisational structure is one of the key manifestations of organisational design. The organisational structure defines the division, grouping and coordination of tasks carried out in the organisation. Seven key dimensions should be considered in the design of an organisational structure, and each affects how the tasks are performed in the organisation.[5] These are

- **work specialisation**, how the tasks in the organisation are subdivided into separate jobs;
- **departmentalisation**, how jobs are grouped;
- **chain of command**, the hierarchy of reporting relationships;
- **delegation of authority**, how much decision-making authority is delegated to each job;
- **span of control**; the number of staff reporting to each manager;
- **formalisation**, the extent to which rules, procedures and other operational guidelines (standard operating procedures) are documented and enforced and
- **geographical space orientation**, the extent of how the utility is geographically dispersed - urban, rural, regional or country wise spread.

Organisational design should allow for and support the following:

- **Clarity on the roles and responsibilities** of managers and staff;
- **Accountability for performance**. The management and staff need to be held accountable for achieving organisational performance targets;
- **Decision-making**. Managers and staff need to be able to make decisions necessary for effective performance of their duties and to achieve the organisation's performance goals.

The following shifts in organizational structure are envisaged to give effect to the trading services turnaround strategies:

[3] This discussion is based primarily on Kingdom et al (2018) "Organisational design for improved performance of urban water utilities in developing countries." and sources used in that article.
[4] Adapted from Conner et al (2012)
[5] After Sepehri et al (2011)

- **Customer orientation.** An appropriate emphasis and organisational focus on customers, recognising that the trading services business exists to serve its customers. Structures and processes need to be put in place to listen to and better understand customer experiences and perspectives.
- **Commercial orientation.** A much stronger emphasis on the trading nature of the business, revenue management and financial viability, recognising that services cannot be sustainable without this. The latter is critical to the success of trading services business. For electricity distribution the changing business model and bi – directional power flow in the operation of the retail part of the value chain needs to be acknowledged and accommodated in the organisation structure.
- **Focussed Investment for business turnaround/performance.** A greater focus on a holistic investment approach looking at the complete value chain of service delivery on what the business can afford and how to invest to drive long term sustainability. Not only a dominant infrastructure focus as in the in the past.
- **The primacy of service performance,** through operational performance and effective procurement and investment. Support services are in support of effective operations and timely, value-for-money investment, and must support and enable performance. Support functions that are essential to support operational and investment effectiveness must be under the executive management control of the trading services manager, in line with the concept of a single point of management accountability.

*Processes, systems and technology*

Organisation design is much more than the definition of an organizational structure, it also includes the design of how work is organized and undertaken, including the design of processes and systems and the use of technology like OT needs in the utility business.

**Best practice**: Well-performing utilities will use state-of-the-art support tools in managing all processes commonly found in water and electricity utilities around the world, including in accounting, financial management, human resources, procurement and logistics, information technology and operational technologies. These are widely available and there is no need for utilities to reinvent them.

## 3.5 Governance

*This section is from Guidance Note 1, Annexure B: Resource document: Developing and implementing municipal electricity and energy business turnaround strategies and is included here for ease of reference.*

Improving governance in municipal trading services involves two complementary approaches: (i) protecting against poor or corrupt practices, and (ii) creating a trading service structure that promotes better governance through clear rules and norms. These strategies are not mutually exclusive but work together to strengthen governance and improve service delivery.

The core ingredients of sound governance and effective management contributing to good performance of a municipal trading service are set out in Table 2.

*Table 2: Core ingredients of sound governance and effective management*

| Area | Core ingredients of sound governance and effective management |
|---|---|
| Leadership | • Public commitment by political leadership<br>• Dashboard on performance published and regularly updated (see strategy & business plan below)<br>• Regular engagement and communications on progress |
| Strategy & plans | • Council-approved Turnaround Strategy with priorities, targets & milestones (ten-year horizon, updated periodically)<br>• Approved business plan in place covering all aspects of the business, with agreed KPI's (timeframe of the A3-PIAP is five years, and it is expected that the Business Plan will inform the indicators for the duration of the MTSR)<br>• Council-approved & funded investment plan aligned to strategy & business plan, (updated annually)<br>• Plans and programmes fully embedded /included in / supported by MTREF |
| Revenue & tariffs | • Council-approved tariff generates sufficient revenue (with available grants) to meet efficient operating costs and necessary investment costs.<br>• Processes and methods for setting tariffs and pricing well-defined and transparent, and based on accepted economic regulation methodologies for public infrastructure<br>• Municipalities must conduct electricity Cost of Supply studies and submit to NERSA for approval of cost reflective unbundled tariffs.<br>• Adopt energy strategies to purchases from multiple power providers (wholesale) to achieve the best blend of energy provision for redistribution to end customers in the retail environment<br>• Adopt the necessary wheeling and trading tariffs (tariff unbundling) in line with best practices and the changing business model for electricity distribution. |
| Governance & oversight | • Oversight committee ("Board[6]") suitably skilled, experienced and trained, for example a Section 80 committee with representatives from academic institutions, business and industry experts<br>• Separate reporting on financial performance for electricity and energy business and water and sanitation (with full set of financial statements (income statement, balance sheet and cash flow) within metro AFS, audited by A/G)<br>• Clear separation of governance role from day-to-day operations and management<br>• Zero tolerance of corruption and patronage |
| Management | • Appointment of capable management team with mandate and autonomy to manage<br>• Accountability for performance with incentives (annual performance review linked to remuneration) |

## 3.6 Leadership and management development

**Best practice[7]**:

- A well-performing trading service recruits and retains a management team that is competent, motivated and adaptive.
- The management team establishes a participatory, collaborative organizational culture dedicated to continual learning and improvement.

[6] If the arrangement is that of a municipal entity
[7] Adapted from EUM

- The management team ensures institutional knowledge is retained and improved upon over time.
- The management team focuses on and emphasizes opportunities for professional and leadership development within the management team and through the organisation.
- The trading services manager strives to create and maintain an integrated and well-coordinated senior leadership team.
- The trading service manager needs to take cognisance of the changing business environment (especially for electrical distribution) and needs to guide and lead the utility business to make the best use of opportunities and mitigate against new challenges to ensure long term sustainability.

Recruitment and appointment processes need to support the above.

Leadership and management development initiatives, including training, coaching and mentoring route be routine programmes in the organization in support of the above.

Consideration should also be given to contracting-in management capacity in the short and medium term where this is needed and appropriate.

## 3.7 Policies

Policies should be:

- Clear and succinct;
- Written in plain language, and translated into official languages as appropriate to the area;
- Easily available and accessible to customers and stakeholders, and
- Reviewed from time to time for efficacy and relevance.

## 3.8 Improving data and measurement

*"You can't improve what you don't measure."*
**Best practice**:[8]

A well-performing trading service understands that measurement is critical to management improvement efforts and that this is the backbone of successful continual improvement management and strategic business planning.

The utility implements a progressive approach to data management and measurement starting with ensuring the basics are in place and with incremental improvement, driven by and focused on answering questions critical to effective internal management and external stakeholder needs and supported by a well-defined decision framework assuring results are evaluated, communicated, and responded to in a timely manner.

## 3.9 Improving plans and planning capability

Best practice planning for **water security**. The metros face significant water security risks as a result of increasing demand, increasing competition for limited supplies and climate change. While responsibility for water resources management lies with the Department of Water and Sanitation, metros should be proactive in understanding their water security risks and work with relevant stakeholders to develop a **water security strategy** and related plans to mitigate water service risks.

[8] Adapted from EUM

These plans should include demand side management as well as diversification of sources, including groundwater, reuse and desalination as relevant to the context.

Best practice planning for **energy security**. While metros are dependent on Eskom for the primary electricity supply, alternative and cheaper sources of electricity are becoming available. Metros need to plan for both energy security and cost optimising by adopting an integrated resource planning (IRP) approach on distribution level for energy and electricity. The focus of this to achieve a least cost power purchase arrangement for the distribution utility. The Energy Efficiency and Renewable Energy Strategy Guide is a helpful resource. See also IRENA (2019) and Mouritz *et al.* (2022).

Best practice for **infrastructure planning**: Water and electricity services are infrastructure intensive and by their nature, asset centric businesses where major projects can take years from conception to completion. A well-performing trading service undertakes **infrastructure master planning** with a long-term horizon that is updated regularly and is used to inform its short and medium-term investment plans incorporated into this business plan. Refurbishment planning is normally part of best practices as part of the AMS as described in table1 of the best practice guideline.

**Water Safety plans** are required by law. The foundation of a water safety plan lies in a comprehensive, preventive risk management approach that prioritizes public health protection. Key principles include embracing a high standard of care, prioritizing source water protection, maintaining multiple barriers to contamination and applying a preventative risk management approach. This multi-barrier strategy involves preventing hazards at the source, removing contaminants during treatment, inactivating pathogens, and maintaining water quality throughout the distribution system. The WHO "Water safety plan manual: step-by-step risk management for drinking-water suppliers**"** provides practical guidance to support development and implementation of water safety planning in accordance with the principles presented in the WHO Guidelines for drinking-water quality. The Water Research Commission has published Guidelines for using a web-enabled Water Safety Plan Tool. The Research Commission has furthermore published guidance on developing emergency response plans: Water Safety and Security: Emergency Response Plans.

For electricity distribution the Occupational and Health Act (OHS) requires certain safety practices and in terms of regulation requirements, licensees are required to include maintenance and refurbishment costs as part of COS tariff studies. Other standards that need to be followed is the distribution grid code that prescribed best practices and approaches.

## 3.10 Stakeholder engagement

Best practice for **stakeholder understanding and support**[9]: A well-performing trading service promotes and facilitates understanding and support from oversight bodies, the community, water catchment interests (in the case of water services), power purchase optimisation (for electricity) and regulatory bodies for service levels, tariff structures, operating budgets, capital improvement programs, and risk management decisions. The utility actively involves stakeholders in the decisions that will affect them.

Metro trading services need to engage regularly with:

- National Treasury as leader of the Metro Trading Services Reforms
- Department of Water and Sanitation as sector lead for water
- Department of Electricity and Energy as sector lead for electricity

[9] Adapted from EUM

- Department of Cooperate Governance
- NERSA (National electricity regulator) for regulatory requirements
- Water boards, Eskom[10] and other bulk services providers (IPP's), wheeling of power and DER's (as appropriate)
- Catchment management agencies (in the case of water)
- Customers through community hall meetings, business forums, consumer councils, among other channels
- Unions
- Community Based Organisations
- Other key stakeholders.

## 3.11 Managing changes

**Best practice: Change management**[11]. A well-managed utility actively engages employees in improvement efforts (helping to identify improvement opportunities and to participate in cross-functional improvement teams; deploys explicit change management processes that anticipates and plans for change and encourages staff at all levels to embrace change; and uses implementation strategies that seek, identify, and celebrate early, step-by-step victories.

## 3.12 Continuous improvement

Achieving significant improvements in trading services performance (financial, operational, service outcomes) will require the adoption of management approaches that embed continuous improvement into organizational culture and practice.

**Best practice: continuous improvement**. A "Plan-Do-Check-Act" framework plays a central role in effective utility management and is critical to making progress through continuous improvement. The framework includes: conducting honest and comprehensive self-assessments; conducting frequent sessions to identify improvement opportunities; following up on improvement projects underway; establishing and implementing performance measures and specific internal targets associated with those measures; defining and implementing related operational requirements, practices, and procedures; establishing clear roles and responsibilities; regular measurement and evaluation; and acting on evaluations through the use of an explicit change management processes.

## 3.13 Prioritisation

The task of improving trading services performance (financial, operation and service outcomes) could appear to be overwhelming, particularly where current practices are far from best practice. It is important to prioritise activities with a view to getting the most significant performance improvements within the available resources.

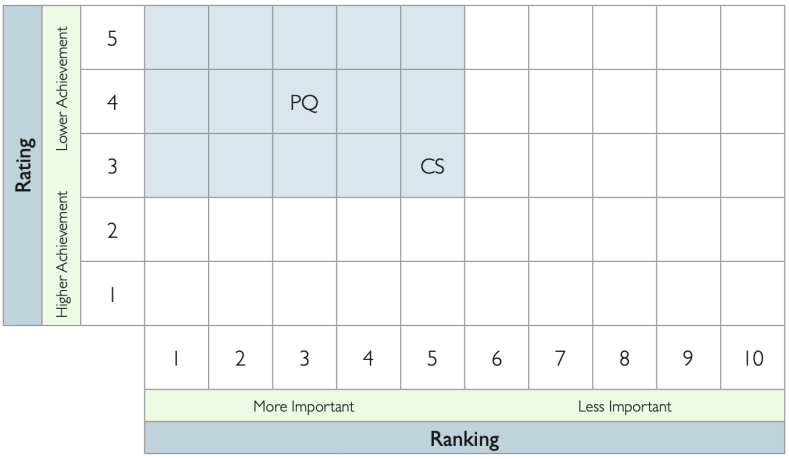
**Best practice: Prioritisation**. A well-managed utility will adopt an assessment and decision-making framework and tool that assists with prioritization. Simple, practical tools can be the most effective. For example, the steps could consist of 1) Assess current conditions, rate the level of achievement against benchmarks or targets in key areas of performance; 2) Rank the importance of each area for

[10] Eskom is used as reference but in the nearby future it will be the NTCSA (National Trading company of South Africa) and NEDCSA- National Electricity Distribution company of South Africa – currently Eskom Distribution)
[11] Adapted from EUM

your utility; 3) Chart the results; 4) Choose one or more Attributes to focus on; and 5) Develop and implement an improvement plan. This tool is described with practical examples in EUM.

An example of prioritisation through rating and ranking different performance areas such as customer service (CS) and product quality (PQ) is given below:

*Figure 5: prioritization framework example*




Note: PQ = product quality; CS = customer service.

While the content of this guideline is comprehensive, prioritisation should be front of mind for management when preparing a *practical* business plan whose purpose is to guide the turnaround in the performance of the business.

The management team should be explicit in their choice of priorities when developing and presenting the business plan.

# 4 Improving customer and commercial services

Customer service activities and the related commercial retail operations are inherent to a utility retail business, are very similar for both electricity and water, as well as in other networked infrastructure services.

A focus on customers, and the related commercial retail operations, is entirely appropriate for both water and electricity utilities, because end customers are responsible for most of their revenues.

Benchmark for **customer satisfaction**[12]: A well-performing utility provides reliable, responsive, and affordable services in line with explicit, customer-accepted service levels. It receives timely customer feedback to maintain responsiveness to customer needs and emergencies normally in line with regulatory requirements."

## 4.1 Customer services

### *Customer charter*

A customer charter should be concise, written in plain language, be accessible and set out:

- Undertakings by the service provider (services and quality of service provided, and responsiveness to customers)

[12] Adapted from EUM

- The responsibilities on the customer (payment of service, responsible use, due care of infrastructure)

*Response to customer complaints*

The trading service should set standards for responding to and resolving customer queries and complaints, and report against these standards.

*Call center performance*

This section should reference best practice benchmarks for call centers, such as

- More than 80% of calls answered within 20 seconds
- More than 70% of calls of resolved on the first call (first call resolution)
- Less than 5% of calls are abandoned.

*Improving understanding of customer experience*

Benchmark for **understanding customer experience**[13]: A well-performing trading service seeks to improve its understanding of customer experience through obtaining feedback from customers on their experience through after-service surveys, comprehensive customer satisfaction surveys and through customer focus groups, among other activities.

The following tools are available and should be used:

- after-service surveys;
- customer surveys; and
- customer focus groups.

## 4.2 Commercial services (revenue enhancement)

### 4.2.1 Customer completeness

**Best practice for customer completeness**. Revenues are lost where customers connect to the network illegally or where customer data is incomplete or lost. A well-performing trading service will have an up to date and accurate customer database, including a unique customer identifier, geo-location, meter status, consumption history etc. The utility will manage an ongoing process to maintain this database, including processes to identify and address illegal connections.

### 4.2.2 Metering effectiveness (completeness and accuracy)

**Best practices**: (water)

- 100% of connections should be metered
- 98% of meters are functioning
- >6% of domestic water meters should be renewed/replaced every year (15-year cycle).
- >20% of commercial/industrial water meters above a specified size should be renewed/replaced each year (5-year cycle)

**Best practices**: (electricity)

- 100% of connections (for reselling) should be metered
- Prudent utilities do not supply more than 2-3 estimated bills within a certain period (typically 12 months) for any individual customer

[13] Adapted from EUM

- Prudent utilities use handheld units (HHUs) for meter reading and do not depend on manual processes, take photos of meters and utilised software applications to digitalise meter readings
- > 98% Industrial and Commercial Metering Performance
- > 98% uptime for and active prepaid meters in the system measured monthly for at least between 6-12 months for accurate values
- Automated meter reading coverage for Industrial and Commercial metering improving to > 98% over period of program.

### 4.2.3 Billing completeness and accuracy

**Best practice**: Complete and accurate billing/vending is fundamental for effective management and financial viability of trading service businesses. A well-performing trading service bills its customers monthly based on actual readings, with a high degree of accuracy. Trading service bills need to be designed so that customers can understand the information presented, and use this to adjust their behavior, for example reducing water use and checking for leaks during times of water restrictions.

Water:

- 95% of meters should be read every month,
- 100% of meters should be read at least once in three months
- 98% of meter readings should be accurate (no corrections).

### 4.2.4 Revenue collection effectiveness

**Best practice**: Revenue collection is a key indicator of management effectiveness

- A well-performing water utility collects 95% or more of the revenues that are billed to customers (World Bank, 2016)
- A well-performing electricity utility collects 97% or more of the revenues that are billed to customers (World Bank, 2016)
- A well-performing water and electricity utility manages customer debt so that net outstanding debt is less than 60 days.

### 4.2.5 Non-revenue water and electricity loss reduction

**Best practice**: Non-revenue water and electricity losses (commercial and technical) are a key indicator of management effectiveness.

All metro water trading service in South Africa should aim to achieve a non-revenue water target of less than 25%. Where practical, non-revenue targets can and should be more ambitious than this. The top 10% of water utilities in Sub-Saharan African have non-revenue water of less than 10.5% (World Bank, 2016).

All metro electricity trading services should aim for electricity distribution losses of less than 10% (NERSA benchmark). The top 10% of electricity utilities in Sub-Saharan African have transmission and distribution losses of less than 8.5% (World Bank, 2016).

### 4.2.6 A strategic plan to reduce NRW

**Component 1: Resources.** A wide range of practical resources are available to water services managers to assist them in developing and implementing non-revenue water reduction strategies and plans in South Africa. These have been collated in the NRW Management Portal (https://managenrw.co.za/).

**Component 2: Knowledge.** The person responsible to develop a non-revenue water strategy and plan should be familiar with the following key concepts:

- How to **measure and assess non-revenue water and its components**, based on the IWA methodology, and related metrics such as the Infrastructure Leakage Index.
- Understanding performance against **industry benchmarks**.
- The need to have an **integrated approach** across both the commercial and physical dimensions of non-revenue water.
- An appreciation of the important role of **pressure management** as one of the most cost-effective tools in reducing non-revenue water.
- The difference and relative importance of **burst and background losses**, and how to use the measurement of **night flows** to inform the non-revenue reduction strategy.
- Application of **economic tools** to inform expenditure choices, including optimization of operating and capital costs over the life of assets, and basing investment choices on payback periods.

**Component 3: A data-informed strategy.** It is important to choose appropriate, pragmatic metrics to measure and understand non-revenue water performance, and to use these metrics to inform spending priorities and to track performance and cost-effectiveness of interventions over time.

**Component 4: Key questions to be answered.** The NRW strategy should respond to the following questions:

1. How much water is being lost? (physical and apparent losses)
2. Where are these losses occurring? (leakage versus apparent or commercial losses, and areas with high losses)
3. What are the causes of the losses?
4. What are the appropriate interventions to address these losses?
5. How do you get maximum benefits for a given level of expenditure? (what are the cost-benefits of different interventions and how should you allocate spending to improve the benefit to cost ratio of reducing non-revenue water?)
6. What systems need to be put in place to establish processes for continuous improvement?

**Component 5: Core elements of a non-revenue reduction strategy.** A non-revenue strategy in the South African context should include the following elements:

- Invest in **systems to improve understanding** (zoning, night flow measurement, pressure and flow measurement, water balances, apparent versus real losses). Excess nighttime system pressure is a major cause of burst leaks; most occur when demand is low and static pressure is high. Minimum night flow analysis is a critical technique for diagnosing leakage problems and guiding interventions; guidelines exist for estimating expected minimum night flow based on population and system characteristics.

- Invest in **pressure management** systems (these investments are likely to have the highest returns) and ensuring these are operated appropriately and maintained. Pressure drives leakage: higher system pressure increases both burst frequency and background leakage rates. Appropriate selection and management of controllers for PRVs is vital: technical complexity should match utility capability and local risks, such as theft and breakdowns. Regular maintenance, boundary valve management, and technical training for staff are essential to maintaining effective pressure management zones.
- Adopt cost- and time-effective approaches for **burst response** through, for example, adopting a prioritized and tiered response approach. Introduce systems to improve leak reporting.
- Invest in processes to identify and **regularize illegal connections**.
- Invest in **metering** (completeness, accuracy), ensuring timely replacement of meters and appropriate use of smart meters where economically justified.
- Ensure an **appropriate level** of investment in **pipe replacement**, informed by sound asset management practices, neither too little nor too much. Pipe replacement is the most expensive intervention to reduce non-revenue water and optimizing this expenditure is very important in a context of scarce resources.
- **Track progress and be adaptive** as new information comes to light, as progress is made and as circumstances change.

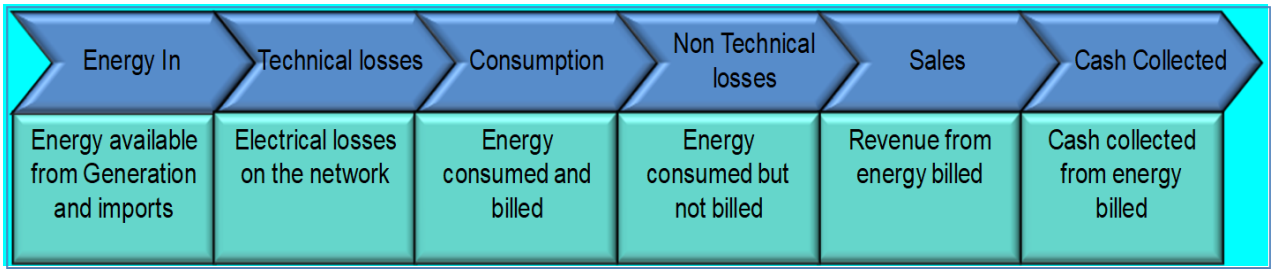
### 4.2.7 A strategic plan to reduce electricity losses

The following is a suggested strategic plan to address electricity losses adapted from Reducing Technical and Non-Technical Losses in the Power Sector (World Bank, 2009).

In electricity supply to consumers, losses refer to the amount of electricity injected into the transmission and distribution grids that are not paid for by users. Total losses include *technical and non-technical components.* Technical losses are inherent, mainly from power dissipation in transmission and distribution lines, transformers, and measurement systems. High technical losses are normally due to aging infrastructure and maintenance backlogs. As a rule of thumb technical losses in metros are between 4.5% and 5.5%, apart from some pockets where assets have been sweated too much and high demand increases have been experienced without the required infrastructure upgrading. Optimization of technical losses in electricity transmission and distribution grids is thus an engineering issue, involving classic tools of power systems planning and modelling and is normally valued at generation cost.

Non-technical losses are caused by actions external to the power system and consist primarily of electricity theft, non-payment by customers, and errors in accounting and record-keeping. It lies primarily in the commercial and collection part of the losses management value chain as illustrated in Figure 6.

*Figure 6: Losses value chain*



The process commences by separating the technical and non-technical losses in the distribution system by performing a load flow analysis on the system to determine the technical losses. The balance is non-technical losses that present *an avoidable financial loss* for the utility. It involves unpaid electricity use: experience indicates that much of this consumption decreases (or have a reduction in demand) once users are required to pay.

The following is a high-level guide and practical description of how to approach non-technical losses.

**Component 1**: **Create a definitive customer focus**. Achieve zero non-technical losses and 100 percent collection in electricity supply to large consumers connected to the high- and medium-voltage network[14]. This can be achieved through the following steps:

- ***Organisation****: Create a large customer organizational unit*
- ***Knowledge****: Design and implement a detailed field assessment on the current situation of all consumers supplied by high-voltage and medium-voltage lines, the largest low-voltage customers, and potential irregular users in these categories. Map these customers back to OT systems[15] for greater transparency and identification.*
- ***Plan****: Define and execute a plan to regularize supply where needed*
- ***Implement*** *AMI: Implement automated meter reading in all points of supply to regularized large customers and implement consumption balancing techniques.*
- ***Monitor****: Define and put in practice operational procedures for periodic systematic monitoring of electricity supply to large customers and for taking immediate corrective action for any irregularity detected.*

**Component 2**: Implement an effective **Customer Management System** (CMS) and related procedures for commercial activities, allowing proper execution and monitoring of all activities related to:

- Metering, billing/vending, and collection
- Dealing with customers (call centres and walk-in)
- Disconnection and reconnection of customers related to customer debt
- Connection of new customers.

**Component 3**: Implement an **Incidence Recording Management System** (IRMS)[16] and related procedures for addressing customer claims caused by poor quality of electricity supply. High service quality gives incentives for on-time payment of bills and helps reduce tampering with metering and damage to equipment belonging to the utility. IRMS is a highly effective tool for dealing with customers' complaints and improving the quality in electricity supply. It allows the company to minimize time elapsed between receipt of the claim and restoration of regular electricity supply and, at the same time, maximize efficiency in the execution of the activities that the company must perform for that purpose. The focus lies on outage transparency and geospatial knowledge of the customer base that is affected by the outage.

**Component 4: Formalise, monitor and measure processes and procedures** for customer service (integrated with the CMS), including

- Metering, billing and collection
- Detection and regularization of fraud and unmetered connections

[14] Also see A3-PIAP indicators E1 and E3 in this regard as calculated in the NT CSP financial model
[15] See section 6.3.2 of this guidance note
[16] In some distribution utilities this is commonly known as an OMS system (outage management system)

- Disconnection and re-connection of customers related to debts and/or fraud
- Dealing with customers at commercial offices
- Dealing with customers by phone (reporting disruptions, billing queries etc)

**Component 5: Regularise supply in areas with high non-technical losses**, adopting different tactics for “manageable” and “unmanageable” areas.

The examples offered below are typical approaches that can be followed by distribution utilities in SA. However, it is acknowledged that successful metros have adopted various tailored made strategies for their own needs and should continue where these have proved to be successful in combatting non-technical losses.

In the case of manageable areas, comprehensive experience in almost all Latin American reforming countries show that consumer discipline is achieved in quite a short time if those irregular consumers become aware that the utility is able to **make fast detection and take corrective action** on fraud and theft.

In the case of unmanageable areas, due to **high crime** for example, regularization should be based on the construction of shielded networks for electricity supply and application of remote metering at each customer connection and also at the transformer supplying a group of consumers. This approach **aims at impeding the construction of irregular connections to the networks and tampering with consumption meters**. This has been implemented with very positive results in dangerous marginalized areas in Rio de Janeiro, for example. While this approach is more expensive, it has been shown to be a sustainable solution in these areas.

*Implementation and change management considerations*

It is recommended that each metro develops an appropriate Revenue Management Strategy based on at least the principles covered here. Decisive council and executive approval must be obtained for its ongoing implementation. Successful utility businesses have such plans in place and have changed their behaviour and way of doing business. “*The solution is the same in all the cases: a team formed by reliable managers actually committed to improving the performance of the utility is appointed for the specific and exclusive purpose of implementing the Strategic Plan. They must be actively supported and led by the CEO. The Strategic Plan is conducted in parallel with regular operations. Once each component of the project is implemented, new related operational procedures are put in place and the old ones displaced and retired. When each component of the Strategic Plan finishes, a brand new transparent approach to efficient management is fully adopted*[17].”

# 5 Improving financial performance

Best practice for **financial viability**. A well-performing trading service understands the full life-cycle cost of infrastructure and establishes and maintains an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. The utility establishes predictable tariffs —consistent with community expectations and acceptability—adequate to recover costs within a predicable subsidy framework, provide for reserves, develops and maintain support from lending agencies, and plans and invests for future needs[18].

[17] Reducing Technical and Non-Technical Losses in the Power Sector (World Bank, 2009)
[18] Adapted from EUM

## 5.1 Financial performance targets

The trading services business for water and electricity should be aiming for the following financial performance targets:

- Positive net profit (income)
- An operating cost coverage ratio of at least 1.5
- A cash collection rate of at least 95%
- Substantially positive operating cash flows that are growing over time
- Net debtor days of less than 60 days
- Where appropriate, infrastructure capex that is significantly higher than current values and that is growing at a rate higher than inflation each year
- A self-financing ratio of 50% or more.

See also Twesigye (2024) for a set of financial performance metrics for electricity utilities.

## 5.2 Financial planning

**Best practice**: Well-performing water and electricity trading service base their planning on a financial model that integrates revenues, operating costs, investment and financing, showing a path of financial viability over time. The financial model is used as a strategic tool to assist with consideration of scenarios and in strategic decision making on priority investments as well as approaches to maintain financial balance over time.

See Guidance Note 5: Service Compact Minimum contents and template for the financial modelling requirements.

## 5.3 Tariffs

**Best practice**:
Tariffs need to meet three broad objectives:

- **Cost recovery / revenue sufficiency** – Trading services must be financially viable for the service providers and ensure a stable revenue stream for the utility through tariff revenues and any funding from government. A failure to achieve revenue sufficiency threatens the long-term viability of the business.
- **Cost-reflective / economic efficiency** – economic efficiency is achieved when the tariff for each customer category is set to reflect the marginal cost that customer category imposes on the service. Efficient tariffs reflect both the level and structure of costs, typically through a two-part tariff (time of use or a three-part tariff as applicable to electricity) consisting of both fixed (demand if applicable) and volumetric components to recover fixed and variable costs, respectively.
- **Cost unbundling of wires and retail** – to cater for the DUOS cost electricity utilities need to unbundle distribution cost to be able to cater for wheeling across their networks to be able to charge appropriately for the use of the infrastructure. It is expected that this requirement will shortly be stipulated in the license requirements of a metro undertaking as well.
- **Affordability** – The right to water is included as a social right in South Africa's constitution. To ensure affordable services for lower-income households, tariff structures should reflect customers' ability to pay. This is typically achieved from a combination of government grants and cross-subsidies between higher-consumption customers charged above the cost of supply and poor households paying a zero or 'lifeline' tariff to meet their essential water needs. A similar approach is often applied in the case of electricity.

Other secondary objectives include:

| | |
|---|---|
| Environmental sustainability | to promote resource conservation and protection in the context of source scarcity or potential damage to the environment. |
| Simplicity and ease of implementation | Easily understood, implementable and relatively cheap for customer base to implement, operate and maintain. |
| Revenue stability | support revenue predictability and stability. |
| Transparency | support transparency in costs and revenues. |
| Acceptability | obtains social and political acceptance and necessary support |
| Promoting access | supports affordable and sustainable access to the services regardless of socio-economic situation |

While these objectives are clear, there are tradeoffs between these objectives and tariff practices differ widely depending on policy, economic, social and cultural context.

From the point of view of Metro Trading Services, revenue sufficiency and the financial viability of the trading service is a fundamental objective.

## 5.4 Financial management

### 5.4.1 Financial accounting and reporting

**Best practices:**

- Implementation of MSCOA as per A3/PIAP indicator A2 (MSCOA compliance)
- Full-cost and transparent accounting for support services, consistent with service level agreements as set out in the Service Compact (M1)
- Production of annual financial statements for the service as per Minimum Commitments M7.

### 5.4.2 Financial decision-making and expenditure management

**Best practices**: Water and electricity utilities implement financial management decision-making, including but not limited to:

- Evaluation of investment and expenditure choices using a holistic approach including **return on investment**, **asset lifecycle approaches**, (that is, decision-frameworks integrate operational and investment expenditure decisions)
- Cost-efficiency and value-for money assessments
- Systems and measures to improve cost-efficiencies and value-for-money, including in the procurement of goods and services
- Budgeting and cost-management processes

# 6 Operations

## 6.1 Optimising operations

**Best practice for Operational Optimization[19].** A well-performing water and electricity utility ensures ongoing, timely, cost-effective, reliable, and sustainable performance improvements in all facets of its operations. It minimizes resource use, loss, and impacts from day-to-day operations. It maintains

[19] Adapted from EUM

awareness of information and operational technology developments to anticipate and support timely adoption of improvements.

*Continuous improvement*

See Section 3.11.

*Standard operating procedures*

**Best practice for Standard Operating Procedures (SOPs)**. SOPs are step-by-step written instructions that document routine and critical tasks performed by utility operators. Well-designed SOPs serve multiple essential functions: they ensure every operator follows consistent and correct procedures, help utilities meet regulatory requirements and industry best practices, and facilitate knowledge transfer when staff turnover occurs or during emergency situations when outside operators provide assistance. When emergencies arise and time is limited, having clear, documented procedures  nothing critical is overlooked.

## 6.2 Operations - Water

For **water services**, the operational section should cover at least the following areas, as relevant:

- Water resources infrastructure (and related considerations)
- Bulk water and wastewater infrastructure
- Water and wastewater network management
- Water quality and wastewater quality management
- Technical and other support services (mechanical and electrical, fleet, laboratory etc.)
- Energy efficiency
- Other areas as relevant

*Note: These sections should be aligned with existing (or proposed) organizational structure and management responsibility in each metro, for clarity of accountability for performance in each area.*

*As for the other sections in the Business Plan, the activities set out in these sections should not be a comprehensive description of all activities undertaken but rather focus on those activities aimed at improving performance.*

*For example, a section on **leak response** should not include a description of current activities but rather state how existing practice will be changed (and what needs to be done to change it) to improve team productivity and 'time to resolution' for reported leaks. This could include, for example, be the introduction of a tiered response protocol as is done in Cape Town.*

### 6.2.1 Water and wastewater network management

*Water and wastewater network management indicators and targets*

Key indicators include:

- Water Network – mains failures frequency / 100 km (A3: PIAP W5)
- Sewer Network – blockages frequency / 100 km (A3: PIAP W6)
- km of sewer jetted as a % of total sewer network
- leak response and resolution performance

### 6.2.2 Bulk water and wastewater infrastructure management

(local storage could be included in this section, and/or with network management)

Examples:

- local reservoir control and balancing of the system to optimize continuity of water supply
- system redundancy to cater for planned maintenance and other unplanned events / external shocks to the system

### 6.2.3 Water and wastewater quality management

*Indicators*

- W2 Drinking Water Systems Blue Drop
- W3 Wastewater Treatment Systems Green Drop
- W4 Wastewater % of samples compliant with license

*Best practices*

- Planning (see section 3)
- Asset management (see section 7)
- Process control
- Operator competencies and training
- Stores and procurement management
- Quality sampling and testing processes
- Risk management
- Emergency response planning and capacity (see section 3)
- Communications and stakeholder management (see section 4)

### 6.2.4 Water resources infrastructure management

Indicators:

- W1 Water Security – input volume % raw water allocation

Best practice examples:

- Forum for joint planning and oversight of water security for the city-region
- A water security strategy and plan
- Oversight of actions to implement water security strategy and plans

### 6.2.5 Support services (water related)

*Mechanical and electrical equipment*

**Best practice**: mechanism and electrical equipment management. Proactive maintenance and timely renewal of equipment.

Indicators:

- Average age of assets and rates of replacement
- Uptime of equipment
- Time to restore functionality

Examples of best practices:

- Effective and efficient procurement and stock management processes
- Proactive maintenance scheduling
- Budgeting for, and implementing, timely renewal/refurbishment/replacement of equipment

## 6.3 Operations – Electricity

### 6.3.1 A rapidly changing market structure

The emergence of prosumers, along with advances in digital technologies, smart meters, automation, artificial intelligence, and ICTs (specifically, blockchain technology), has led to new electricity trading arrangements in the form of aggregators and peer-to-peer trading. **These new arrangements will fundamentally change the function of the grid from a network to a platform** that requires new regulatory models for cost and price determination; the utilities will have to spearhead these models or be ready to cede the role to other market participants. The grid as a platform, rather than a regulated monopoly of delivery infrastructure, was not envisioned in the original Tesla-Westinghouse "bulk grid" model of power supply and subsequent sector reform interventions advanced by the World Bank. The advent of distributed energy resources (DER) and bi-directional flows of energy means that utilities must be rethought and restructured for purpose. Furthermore, it is still not clear how to deal with some of these emerging technologies, such as how to treat batteries as consumers and/or producers[20].

### 6.3.2 Operational technology

As previously stated, well-managed and performing electricity utilities will adopt state of the art support processes, systems and technologies as appropriate to their context.

In the case of electricity distribution operations in many of these metros, existing operational technologies (OT) are either outdated or non-existent.

Metros should include plans to substantially improve their operational and information technology, as applicable for each metro, including but not limited to:

- Distribution Operation
  - SCADA - Supervisory Control and Data Acquisition system: it remotely operates and controls High and Medium Voltage Infrastructure.
  - IRMS - Incident Recording Management System: Basic tool to report complaints received by customers related to the quality of technical services
  - EMS - Energy Management System: an integrated tool with advanced analytics and optimization techniques to improve energy infrastructure efficiency and reliability.
  - OMS, DMS/ADMS - Outage Management Information System, Distribution Management System / Advanced DMS: OMS is a tool to quickly and accurately identify location and analyze extent of an interruption in electricity supply and enable fast resolution and service restoration. It is supported by a detailed representation of the distribution network and links between points of electricity supply and network assets using a Geographic Information system.

- Commercial Operation
  - CMS - Commercial Management Information System - It manages all commercial processes - revenue cycle, customer management, etc. To achieve sustainable good commercial performance, the Metro must incorporate a state-of-the-art CMS
  - AMI - Advanced Metering Infrastructure: an integrated system of smart meters, data management systems and communication networks that enable two-way communication between the utilities and the customers. It plays an important role in the implementation of Revenue Protection Program.

[20] Adapted from Twesigye, 2024

- Digital Contact Centre services - One hub system where essential calls and notifications come and go. It combines live agents with automated solutions and deals with mass notifications. It improves customer service and efficiency in revenue cycle operation.

- General services
  - GIS - Geographical Information System: it maps customers (point of electricity supply), network infrastructure and customers' connections and links with network assets over a geographical single platform.

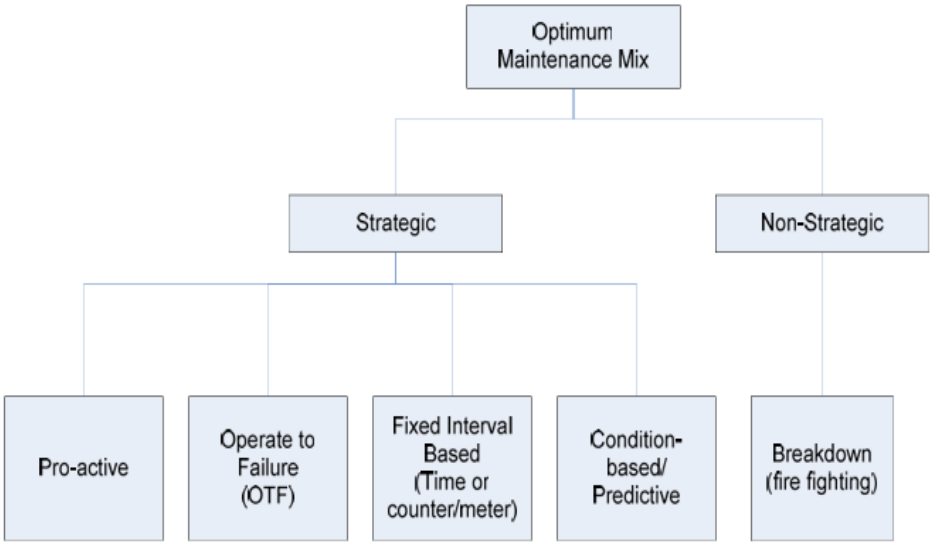
### 6.3.3 Energy purchases and wheeling

Bulk purchases of electricity comprise about 70% of total expenditure for metros. Over the last 11 years the gross profit of metros has been declining, and it is of paramount importance that metros perform a mini IRP ( see section 3.9 of this guidance note) to determine the best future purchases regime for the electricity undertaking – with other words what is the best blend of bulk purchases based on the demand profile requirements of the utility. The latter is important whether they decide to be a wholesale market participant or not. Various options in this regard is possible and more information can be found in "Electricity Pricing and sector reform: A summary of key concepts and strategic Questions Technical report. SEA for Presidential Climate Commission; September 2025". As purchases will be from multiple sources (including wheeling across networks) in the future in a bi-directional environment the nature of the retail market will also change. The utility of the future will have functional requirements for the DET and DSO functions to accommodate the changing environment in wholesale and retail electricity, aligned with the SPoMA concept.

### 6.3.4 Network maintenance

Network maintenance requires a proper 1) Strategy and Planning approach and the 2) work management and execution thereof is inherent part of the AMS approach of the utility business. As part of the planning, the maintenance philosophy is a statement of principle to guide maintenance management decision making, explaining "what" an electricity utility intends to achieve regarding maintenance management. The maintenance strategy needs to be a long-term plan (ongoing), covering all aspects of maintenance management (HV, MV and LV) which sets the direction for maintenance management, and contains firm action plans for achieving a desired future state for the maintenance function explaining "how" the maintenance philosophy will be addressed / implemented. To improve the Indices ASIFI (E6) and ASIDI (E7) under the operational requirements of the MTSR program, it is necessary that the metro utility business have the correct maintenance mix of all types of maintenance as indicated in Figure 7.

*Figure 7: Maintenance mix*




The latter needs to be included in the AMS of the metro utility business, properly documented in maintenance plans and adopted in the formal maintenance processes and schedules for ongoing execution with budget support. It is recommended that each metro develop the above-mentioned strategies, officially adopt them and implement them as part of their business operations.

### 6.3.5 Network operations[21]

The metro undertaking that follows best practices will deploy the following action as part of its Network operations. It may include amongst others the following activities:

- *System Operation and Control* encompass the essential activities required to ensure the reliable and efficient functioning of the electricity network. This involves continuous monitoring and management to maintain stability and meet demand requirements.
- *Network Optimization* focuses on maximizing the efficiency and effectiveness of the electricity network. This includes balancing load distribution, minimizing losses, and ensuring that the network operates within its optimal parameters to deliver consistent and reliable service to customers.
- *Outage Management* involves the processes and systems used to quickly detect, assess, and resolve network outages. Effective outage management minimizes downtime and restores service efficiently. *Demand Side Management* consists of strategies to influence and control consumer electricity usage, aiming to flatten peak demand periods and improve overall network reliability.
- *System Metering* entails the accurate measurement and recording of electricity flow throughout the network. This supports monitoring, billing, and verification of supply and demand, ensuring transparency and accountability in network operations.
- *System Performance* is evaluated through key indicators that measure the reliability, efficiency, and quality of the network's operation. Regular assessment of these metrics ensures that the network meets operational standards and supports continuous improvement initiatives.

Best practices will require the electricity distribution business to incorporate these functions in SOP as well as including the responsibilities in the organisational design of the utility business. Much of the above is included in the emerging role of the DSO.

[21] Adapted from EDI Holdings EDI Blueprint

## 6.4 Support services generic to water and electricity

### 6.4.1 Fleet management

Fleet management is a critical operational support function for water utilities, where reliable vehicles and mobile equipment support effective service provision.

**Best practices for fleet management**. The appropriate goals are to manage for a combination of vehicle availability, utilization and cost optimization. Practices should seek to optimize vehicle maintenance intervals and practices, optimize vehicle lifecycle costs and manage vehicle usage and costs through appropriate vehicle tracking and management systems. These systems need to be under the executive management authority of utility management.

Best practice examples:

- Benchmarking performance and costs and setting appropriate benchmarks and targets
- Installing and managing vehicle tracking and management systems
- Vehicle maintenance management with attention to frequency of maintenance, maintenance turnaround times, optimizing maintenance and asset life-cycle costs etc.

### 6.4.2 Energy efficiency

Energy can be a significant input cost. Best practices include optimizing energy efficiencies across all operations and reducing the carbon footprint in both water and electricity utility operations, including introduction of renewable energy sources where economically justified.

# 7 Asset management and investment[22]

Best practice for **infrastructure stability and reliability**. A well-performing water and electricity utility understands the condition of, and costs associated with critical infrastructure assets. It maintains and enhances the condition of all assets over the long-term at the lowest possible life-cycle cost and acceptable risk consistent with customer, community, and regulator-supported service levels, and consistent with anticipated growth and system reliability goals. It assures asset repair, rehabilitation, and replacement efforts are coordinated within the community to minimize disruptions and other negative consequences.

Best practice for **infrastructure and operational resilience**. A well-performing water and electricity utility ensures utility leadership and staff work together to anticipate and avoid problems. It proactively identifies, assesses, establishes tolerance levels for, and effectively manages a full range of business risks (including legal, regulatory, financial, environmental, safety, security, and natural disaster-related) in a proactive way consistent with industry trends and system reliability goals.

Best practice for **resources adequacy and security.** A well-performing water and electricity utility ensures water/energy availability consistent with current and future customer needs through long-term resource supply and demand analysis, conservation, and public education, working proactively and collaboratively with relevant stakeholders. It explicitly considers its role in water/energy availability and manages operations to provide for long-term sustainability and, where appropriate replenishment, and considers and integrates diverse sources of water/energy as appropriate. (See also planning for water/energy security in Section 3.7)

[22] Adapted from EUM

## 7.1 Asset management

**Background: Historic versus Current Replacement cost (CRC)**

Traditionally and perhaps the most common way to structure tariffs of the utility is based on the average cost of providing the service - hence the historic cost or book value in the books of the utility is utilised to derive the accounting cost to provide the service. For *long term assets in a capital intensive industry such as the trading services of the metro*s, the role of inflation in asset replacement is important. Additionally, due to technology change, replacement with an identical asset is rare. The amount that needs to be paid for the asset is thus inevitably more than the original value of obtaining it. This need also comes to the fore in many of the financial statement requirements that stipulate the importance of regular re-evaluation of assets to reflect the current status quo of the assets as best as possible.

The net asset value as normally displayed in the accounting records of utilities is not representative of the economic value for utility sustainability, and pose a challenge in both tariff and refurbishment/replacement determination. Depreciation on the other hand, should be *reflective of the consumption of the engineering assets* of the metro utility resulting from, for example, engineering forces of wear and tear, decay, some deterioration caused by natural elements, inadequacy, obsolescence or changed customer requirements. This is sometimes added to reflect the original value better.

However, in a regulatory environment like that prevailing in metros (even if regulation has only been introduced late in the “asset life” of many of the metros) depreciation is of economic significance since it needs to be incorporated into the rates of the revenue requirements of the entity. It is thus not the recovery of the capital invested that determines the price for the regulatory regime, but depreciation as a means to generate funds for replacement at ***current price levels rather than just recovering initial costs.*** For most metros, where there is a significant difference in net book value versus engineering value from the asset management processes, it will be from a sustainability point of view catastrophic to rely on net asset values and depreciation details based on historic values alone. It is clear that the recovery of net book value asset costs for metros will simply not yield the required return to ensure sustainability of the metro trading service. The principle of replacement is a common denominator in industries where price control is relevant, and prices need to be calculated for regulatory purposes.

If metros use revalued assets as base, the allowance for the replacement portion would obviously reflect higher in the tariff as in the case of the historic asset approach. If reflected correctly in the books, the higher depreciation will produce lower profits, but historic cost will not keep up with the true current state of the utility from a revenue requirement approach.

The more correct way would be to determine the tariff on the economic cost of supply that will incorporate the above factors to ensure sustainability of the metro undertaking. As such it is recommended that the asset registers should reflect the DRC cost and the financials should be based on a similar approach to ensure metro sustainability.

**Best practices**:

- The asset register is up to date and complete, reflecting a CRC approach, with age and condition of assets, and other necessary information to determine the DRC values correctly. (In a resource-constrained environment, the perfect may be the enemy of the good – reasonable knowledge of all assets is better than complete knowledge for only a sub-set of assets with large blind spots in other areas.)

- Maintenance and investment (asset renewal/replacement) decision-making is informed by existing and forecast asset conditions and lifecycle costs as described above.
- Asset management practices follow international best practice protocols (for example, International Infrastructure Management Manual (IIMM), 6th Edition or ISO 55001), suitably adapted for local circumstances.

## 7.2 Investment plan

The Business Plan should include an investment plan.

Best practices:

- The investment plan must match the capex projections in the financial model and set out in Section 5.5 (Financial Plan), that is, it must be a funded/fundable investment plan.
- The investment plan should include all priority investments that fit within the funded/fundable capex envelope as shown in the Financial Plan as per the financial model.
- If investment needs exceed the affordable, funded/fundable capex programme shown in the financial plan, then investment needs that exceed the investment plan can be shown separately.

## 7.3 Priority investments

Investments should be prioritized in the first instance in relation to the extent to which these investments will contribute to financial performance improvements.

### 7.3.1 For financial performance improvements

These include investments for revenue enhancement and to reduce costs / improve efficiencies.

For water, investments should cover at least the following categories

- customer service improvements
- water supply reliability
- reduction in NRW and water losses
- water quality
- environmental quality
- system expansion to meet new demand
- service access in informal settlements
- metering completeness and accuracy
- SCADA and management information systems
- vehicles and plant

For electricity, the investment should include at least the following categories:

- Loss reduction improvement (including metering)
- customer service improvements
- energy availability and quality of service (including from diverse energy sources)
- service and network reliability
- energy trading and wheeling (DET)
- system expansion to meet new demand
- service access in informal settlements
- vehicles and plant

# 8 Human resources

Best practice for **employee and leadership development**[23]: A well performing water and electricity utility: recruits and retains a workforce that is competent, motivated, adaptive, and safe working; establishes a participatory, collaborative organization dedicated to continual learning and improvement; ensures employee institutional knowledge is retained and improved upon over time; provides a focus on and emphasizes opportunities for professional and leadership development and strives to create an integrated and well-coordinated senior leadership team.

*Best practices for capacity and skills development*

- Fit-for-purpose job descriptions
- Management of critical skills
- Career paths and succession plans
- Bursaries and mentorship programs for professional engineering skills
- Supporting professional development
- Improving artisanal skills base
- Technical training as applicable

(see also leadership and management in Section 3.4)

*Best practices for recruitment and contracting in capacity*

- Monitoring and managing vacancy rates
- Efficient staff recruitment process
- Staff selection best on competency and merit
- Appropriate contracting in of external capacity

*Best practices related to staff satisfaction and productivity*

Monitoring and managing:

- Staff turnover
- Staff satisfaction (surveys)
- Absenteeism
- Overtime
- Other productivity measures

# 9 Service outcomes and social contributions[24]

The **core purpose of a water and electricity utility is to provide effective water and electricity services** at a suitable quality and level of reliability to all customers. At the same time, the utility operates within a social context and can also make important contributions to the overall sustainability of the communities within which it operates.

Best practice for **product quality (water)**: A well-performing water utility produces potable water and treated effluent, in full compliance with regulatory and reliability requirements and consistent with customer, public health, and ecological needs.

Best practice for **product quality (electricity)**: A well-performing electricity utility makes available electricity in full compliance with regulatory and reliability requirements and consistent with customer, public health, and environmental needs.

[23] Adapted from EUM
[24] Adapted from EUM

Best practice for **community sustainability**: A well-performing water and electricity utility is aware and attentive to the impacts its decisions have on current and long-term future community and environment health and welfare. It manages operations, infrastructure, and investments to protect, restore, and enhance the natural environment; efficiently uses water and energy resources; promotes economic vitality; and promotes and supports overall community improvement. It explicitly considers a variety of pollution prevention and source protection approaches as part of an overall strategy to maintain and enhance ecological and community sustainability.

## 9.1 Improving services in informal settlements

The most significant difference to people's lives, and hence to community well-being, can be made by providing an adequate water and electricity services in a context where no such service already exists. This is typically the case in informal settlements. (Formal developments in the metro areas will almost always have a formal piped and electricity supply to the property boundary.) Water and electricity service authorities are required to ensure the provision of services that meet legislated minimum requirements.

**Legislative requirements (water)**: This requires providing an interim water supply service within 90 days of becoming aware of a new informal settlement with access within 200m and otherwise meeting the definition of a basic service as per the regulations for quality and reliability. Tanker services may not exceed 12 months. Where a settlement is formalised, a basic service must be provided.

## 9.2 Anticipated improvements in service outcomes

The anticipated improvement in service outcomes because of the activities undertaken in the Business Plan should be set out here. This should include, but not be limited to the following:

- Service access
- Service quality
- Service reliability
- Environmental compliance

## 9.3 Other social contributions

Other social contributions made by the water and electricity utility can be mentioned here. Examples include:

- Management and employee diversity
- Contributions to job creation

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