



CAHIER DES CHARGES TECHNIQUES – TERMES DE REFERENCE PRESTATIONS INTELLECTUELLES

Agence Française de Développement

5, rue Roland Barthes

75598 Paris Cedex 12 - RCS PARIS B 775 665 599

Téléphone : + 33 (0)1 53 44 31 31

Concernant la prestation

**« THE STUDY ON ECONOMIC AND SOCIAL IMPACTS OF ILLEGAL ELECTRIFICATION IN 8
SOUTH AFRICAN METROPOLITAN, AND 3 SELECTED LOCAL (MADIBENG, MBOMBELA AND
MATLOSANA) MUNICIPALITIES »**

TERMS OF REFERENCE (TOR) FOR THE STUDY ON ECONOMIC AND SOCIAL IMPACTS OF ILLEGAL ELECTRIFICATION IN 8 SOUTH AFRICAN METROPOLITAN, AND 3 SELECTED LOCAL (MADIBENG, MBOMBELA AND MATLOSANA) MUNICIPALITIES

AFD Group

The French Development Agency (AFD) is a public financial institution that implements the policy defined by the French Government, with the purpose of fighting poverty and promoting sustainable development. AFD operates on five continents via a network of 85 offices, and finances and supports projects from public actors that improve living conditions for populations.

The AFD Group has two subsidiaries. The first one, Proparco, supports private investments through equity investments and loans to the private and social business sectors. The second one, Expertise France, joined the AFD Group in 2022 and is an international technical cooperation agency which works alongside partner countries to advise and support them in developing their public policies. With Proparco and Expertise France, the AFD Group now provides a complete and unrivalled approach to sustainable development. In 2024, AFD Group earmarked EUR 13.7 billion to finance projects in 160 countries and French Overseas Territories. These socially responsible and sustainable investments are in line with the Group's dual mandate: to support the most vulnerable communities, particularly in countries in crisis; and to care for the common good, especially in emerging countries.

The AFD also work closely with French and international research networks to contribute to the global debate on development. The Agency manages the French Global Fund for the Environment (FFEM) which co-finances projects combining environmental sustainability and development.

All information pertaining to the AFD, including the Code of Ethics that the service provider is highly invited to consult, is accessible through the following link: www.afd.fr.

AFD in South Africa

Present in South Africa since 1994, AFD has supported over 180 projects so far and invested more than €4billion, across many sectors including energy, water, urban development, transport, and biodiversity. Strategic priorities of AFD in South Africa include: (1) supporting a Just Energy Transition (JET), (2) advancing sustainable urban development, (3) reducing multidimensional inequalities, and (4) protecting biodiversity. Building on France's political commitment to support South Africa in its Just Energy Transition (JET), AFD has a strong and active support to the JET, especially on the social dimensions of the JET, through financings and promotion of the policy dialogue.

1. BACKGROUND

There are 167 licensed distributors that supply electricity to customers in South Africa, eight of them being the metropolitan municipalities. Municipalities use both conventional (postpaid) and prepaid meters in the provision of electricity services to their customers. The prepayment system uses the Standard Transfer Specification (STS) technology to measure and charge water and electricity. The STS is the global standard for the transfer of electricity and other utility prepayment tokens. All 4.5 million prepayment meters in municipalities that were based on STS

technology were going to stop dispensing electricity on 24 November 2024 if they were not upgraded.

South Africa has over 10 million STS electricity prepaid meters, of which 7 million are managed by Eskom and over 4 million are managed by municipalities including metropolitan municipalities (Metros). Municipalities have been implementing the STS TID (Token Identifier) rollover project until the deadline of 24 November 2024. Metropolitan municipalities have over 2 million prepayment meters, which represent just over 50% of the total prepaid meters in municipalities that are licensed to distribute electricity.

By 24 November 2024, 97.4% of prepaid meters in the municipal areas of supply were successfully converted to KRN2 (Key Revision Number 2) meters. The remaining 2.6% are meters that are:

- ✓ By-passed;
- ✓ Faulty; and/or
- ✓ Duplicated on the municipal system

The remaining 2.6% are subjected to a revenue protection programme, which is on-going.

The TID rollover helped municipalities to address the non-vending meters challenge, and it has been evident that revenue collection has improved significantly. However, there are still customers that are non-metered, i.e., they connect electrical cables directly from the overhead transformers on the street to different households, and there are no meters for such customers. This is common in areas such as newly established informal settlements that are not yet electrified.

Metropolitan municipalities have 59.9% share of electricity sales in South Africa (Table 1). Half of the municipalities were found to have substantially high number of prepaid meters that were not vending during the TID rollover project. Furthermore, most of the illegal electrifications were noted in the metropolitan municipalities.

Table 1: Metropolitan municipalities share of electricity sales

MUNICIPALITY	% SHARE	Province
Ekurhuleni	12.9	Gauteng
City of Johannesburg	11.8	Gauteng
City of Cape Town	11.6	Western Cape
eThekweni	11	KwaZulu Natal
Tshwane	7.3	Gauteng
Nelson Mandela Bay	3.2	Eastern Cape
Mangaung	2	Free State
Buffalo City	1.5	Eastern Cape
Total share (%)	59.9	

2. PROBLEM STATEMENT

Municipalities are facing significant challenges with regard to electrical losses, the non-technical losses in particular, as well as non-payment of debts. This is partly due to customers who have

by-passed their prepaid meters and are not vending. During the electricity prepaid meters TID rollover, there were many prepaid meters that were found to be non-vending; these are:

- Meters that have been by-passed;
- Meters that are faulty;
- Meters that have been tampered with; and
- Meters that are duplicates on the municipal system

Furthermore, SALGA (South African Local Government Association) conducted a survey to quantify the non-vending meters identified during the implementation of the TID rollover project and subsequent revenue loss. The survey sought to determine and quantify the electricity of prepaid non-vending meters identified during the STS TID rollover, to estimate the revenue losses caused by the non-vending customers in the top 20 municipalities, and to assess whether the TID rollover had an impact on municipal revenue collection improvement.

It was found that over 1 million prepaid meters had been by-passed, which is resulting in over R8 billion loss per annum. Some municipalities had over 50% of their prepaid electricity meters by-passed. Municipalities owe Eskom over R100 billion, and also municipalities are owed by customers over R300 billion inclusive of electricity, water, taxes and rates etc.

There are customers that are non-metered, which were not affected by the TID rollover. These customers connect electrical cables directly from the transformers on the street to different households. There are no meters for such customers. This is common in areas such as newly established informal settlements that are not yet electrified. Thus, illegal electrification involves unauthorized connection of electricity from the nearby infrastructure (mainly transformer) to electrify or connect the entire informal settlement using home-made poles and cables, whereas illegal connection involves tampering of meters at a household level to allow electrons to flow or by-pass the meter. Metropolitan municipalities have more than 150 informal settlements, some of them are formally electrified, whereas others are not yet electrified. Some are located on private land that is illegally occupied and these are most likely to electrify themselves illegally as distributors won't be able to electrify such areas.

It is from this background that South African Local Government (SALGA), Municipal Infrastructure Support Agent (MISA), National Treasury (NT) and the Department of Cooperative Governance and Traditional Affairs (CoGTA) seek to conduct further studies to establish the severity and magnitude of illegal electrification in South Africa, to estimate the potential losses consequent to illegal electrification. SALGA has a clear strategic role to play in representing the interests of local government within the system of government as a whole and supporting its members to fulfil their developmental obligations. MISA supports municipalities to conduct effective infrastructure planning to achieve sustainable service delivery and manages the provision of implementation support services on infrastructure projects, operations and maintenance of municipal infrastructure, and CoGTA leads the cooperative governance system in support of integrated planning and implementation across all spheres of government, moreover, it facilitates and coordinate intergovernmental relations to support the development, implementation and monitoring of integrated plans and capacity building programmes.

Moreover, there are broader social factors that drive illegal electricity connections across different municipal jurisdiction, these include electricity affordability challenges due to high unemployment rate and poverty, the prevalence of informal settlements, and other socio-economic constraints faced by households. The illegal electrification may result in social and economic risks including potential increases in electricity costs, reduced network reliability and safety, and heightened social tensions.

This Terms of Reference (ToR) outlines the scope and objectives for the illegal electrification study, aimed at providing a comprehensive picture of the magnitude and severity of illegal electrification in South Africa, quantifying the non-technical losses consequent to illegal electrification in different parts of the country.

3. OBJECTIVES

The overall objective of the study is to establish, assess and determine the nature, severity and magnitude of the illegal electrification in the eight (8) metropolitan municipalities and three (3) other selected local municipalities (Madibeng, Mbombela and Matlosana) in South Africa as well as the socio-economic factors. Based on this assessment, the study will quantify the non-technical losses, their impact on the municipal revenue and formulate recommendations, taking into account the associated socio-economic risks and opportunities.

The work will be divided in two tranches: a firm one and an optional one.

4. SCOPE OF WORK

A – Firm tranche

The detailed scope of work of the first tranche is as follows:

- To conduct a study on the magnitude and severity of illegal electrification in the selected municipalities
- To establish the impacts on municipal service delivery disruption consequent to illegal electrification;
- To identify, distinguish and quantify the socio-economic household groups involved in the illegal electrification (indigent households, etc.) at a macro level and their status, including revenues, employment status, poverty levels (with gender-disaggregated data);
- To establish the causes (socio-economic) and factors behind the illegal electrification per group
- To compare and contrast settlement types with high rate of illegal electrification in the selected municipalities;
- To quantify the non-technical losses consequent to illegal electrification and their impact on municipal revenue
- To determine how much municipalities lose per annum from the use of electricity illegally connected electricity and to determine how much municipalities lose in revenue from maintenance costs associated with repairs to electricity infrastructure, such as transformers, as a direct result of damages caused by illegal connections;
- To explore the cost-benefit analysis for households/communities currently on illegal electrification and the possible solar home system solutions available.
- To quantify the operational and safety risks (e.g., transformer overload, network failures, fires, electrocutions) caused by illegal electrification and develop appropriate risk response plans. These should translate into additional repair costs and reputational risk for municipalities;
- To analyse the social risks associated with illegal electrification and the social risks associated with regularizing illegal electrification and identify mitigation measures, particularly for indigent households and for vulnerable communities;
- To identify a few priority municipalities where the social risks of reducing illegal electrification will be the most critical

- To assess the effectiveness of existing revenue protection programs (meter audits, disconnections, credit control) across metros and benchmark against best practices;
- To develop a set of recommendations (technical, operational and socio-economic interventions) to prevent illegal electrification and national action plan to prevent this practice;
- To recommend technology-driven solutions (such as feeder monitoring, GIS mapping of losses); and
- To provide guidelines for different sets of challenges in the municipalities to manage and mitigate illegal electrification sustainably

B – Optional tranche

- To develop an operational strategy and detailed action plan with tailored recommendations for 3 priority municipalities

5. PHASED APPROACH

A - The expected work for the firm tranche will include the following steps:

- 5.1. Develop an illegal electrification inception report for the metropolitan, Madibeng, Mbombela and Matlosana municipalities in South Africa;
- 5.2. Prepare and present the overall inception report and proposed timelines for the metropolitan, Madibeng, Mbombela and Matlosana municipalities and reach agreement on dates, resources, obligations of each municipality and of the service provider in order to achieve the overall assignment objectives;
- 5.3. Develop a project plan depicting a GANTT chart demonstrating the project schedule and implementation plan;
- 5.4. Be responsible for the overall management of the assignment and engage with SALGA, MISA and CoGTA through a steering committee. Provide secretariat function to the steering committee;
- 5.5. Assess the cost of infrastructure repair and upgrades resulting from overloads and tampering emanating from illegal electrification;
- 5.6. Explore community behaviour regarding electricity access, legality, and affordability;
- 5.7. Analyse how illegal electrification affects public perceptions of municipalities and service legitimacy;
- 5.8. Conduct the literature review and benchmark with the international experience in the developing nations in different continents and the best practice on how illegal electrification was dealt with
- 5.9. Conduct audits and collect data using appropriate and acceptable sampling method (including audits and interviews with different categories of customers e.g. residents, business, commercial customers as well as municipal officials) from each targeted municipality relating to electricity business assets. Identify areas of losses, both technical and non-technical. This should include but not limited to inspections, technical audits and comprehensive data analysis;
- 5.10. Identify root causes for illegal connections and electrification (for the different socio-economic household groups and categories of customers, i.e. low, medium and high-income households, etc.), socio-economic status such as household income, employment status, and poverty levels and develop a national plan with clear recommendations to address losses and prevent future recurrence;
- 5.11. Conduct the cost–benefit analysis for households/communities currently using illegal electrification and explore the possibility of off-grid solutions such as solar home systems and gas stoves

- 5.12. Present preliminary results on the state of illegal electrification in the metropolitan, Madibeng, Mbombela and Matlosana municipalities in South Africa;
- 5.13. Compile and present the draft report on the state of illegal electrification in metropolitan, Madibeng, Mbombela and Matlosana local municipalities in South Africa to the Steering Committee and other governance structures;
- 5.14. Develop monthly and quarterly progress reports in a report and presentation formats
- 5.15. Develop a comprehensive close out report on the project and what has been achieved with recommendations going forward, to be presented to the project steering committee;
- 5.16. Recommendations must be broken down into the following interventions:
 - Technical interventions (smart meters, feeder monitoring, prepaid enforcement)
 - Operational interventions (audit teams, special investigation units, legal enforcement)
 - Socio-economic interventions (subsidized connections, electrification rollouts).
 - Law enforcement and legal implications, and the role of law enforcement agencies
- 5.17. Conduct workshop(s) with the municipalities to present and capacitate municipalities on the strategies and mechanisms to prevent illegal electrification
 - Identify with the municipalities their priorities to address in terms of areas, socio-economic groups, biggest loss factors (and other factors deemed relevant), based on the cost-benefit analysis
 - Design an action plan translating the recommendations into practical activities, for the municipalities to use as a general implementation guide
 - Advise and design a governance system assigning roles and responsibilities to implement the action plans
 - Provide training on tools and procedures where relevant

B - The expected work for the optional tranche will include the following steps:

- 5.18. Conduct additional interviews and workshop(s) in the pilot municipalities to translate recommendations from the national action plan into tailored ones to address the specific challenges
- 5.19. Develop a detailed operational action plan including timelines, resources, roles and responsibilities

6. METHODOLOGY

- 6.1. The overall methodology must indicate what types of data will be collected, how will such data be collected, which sampling techniques will be employed,
- 6.2. The interviews will be done through appropriate sampling of members of the community (residence), ward councillors and community leaders;
- 6.3. Moreover, the methodology should include data collection through data analytics (identify sudden drops in vending per feeder/transformer), GIS heatmaps of non-vending meters, and technical audits with revenue protection units;
- 6.4. The project methodology must also conduct comparative analysis of municipalities to identify common patterns and unique challenges across the board;
- 6.5. The project plan must specify the timelines and activities throughout the project duration;

- 6.6. The methodology must include support and capacity building for the municipalities on the strategies and mechanisms to prevent and curb illegal electrification, which is replicable in other municipalities, and
- 6.7. The service provider will be expected to work closely and collaboratively with the 11 targeted municipalities, ensuring that relevant municipal officials understand the study process and outcomes and have the capacity, post the study, to draw on the outputs of the study to develop their own specific action plan to prevent the illegal electrification in their respective municipalities

7. DELIVERABLES

A- Firm tranche

The service provider is expected to provide the following deliverables:

- 7.1. **Inception report** outlining the work plan, methodology, and timeline;
- 7.2. **Stakeholder engagement plan** including feedback from interviews with stakeholders including local residents, ward councillors, Department of Electricity and Energy, officials of the municipalities etc.;
- 7.3. **Monthly and quarterly progress reports** outlining progress against project plan
- 7.4. **Draft report** and action plan to be presented to the project steering committee
- 7.5. Hosting at least one **National workshop & Action Plan** with recommendations to resolve the illegal electrification, and the workshop output / report should include the national action plan that recommend a standardized enforcement framework across municipalities (currently fragmented).]
- 7.6. **Comprehensive Final report and a close out report** on the project and what has been achieved with recommendations going forward, to be presented to the project **steering committee**.
- 7.7. Deliver a **Municipal Loss Dashboard** (to be placed on SALGA website) to allow ongoing monitoring after the study ends, and improvement in non-technical losses;
- 7.8. Include a Revenue Protection Training Module for municipal officials, capacitating them beyond just reports and
- 7.9. **Municipal workshop report** with inputs from the municipalities in the strategies and mechanisms to prevent illegal electrification and the main socio-economic drivers, including municipalities prioritized areas of action and generic action plan

B- Optional tranche

- 7.10. For the three pilot municipalities, the service provider is expected to develop a detailed operational action plan with tailored recommendations

All the work done in this assignment remain the property of SALGA, CoGTA and/or the respective municipality.

8. TIMELINES

The overall project is expected to take approximately twelve [12] months from the initiation date.

9. CONSULTANT QUALIFICATIONS AND EXPERIENCE

The appointed bidder will be expected to demonstrate experience, technical ability and capacity to undertake an assignment of this complexity. The skills and knowledge requirements must include but not limited to:

- Electrical Engineering,
- Asset management,
- Finance (including revenue management) and/or auditing.
- Project management skills
- Expertise in smart metering technologies, communication protocols, data analytics, cybersecurity and energy management systems.
- Knowledge of regulatory frameworks a compliance requirement in the energy sector.
- Strong project management skills, with experience in managing multi-stakeholder projects.
- Strong data analytics and presentation skills
- Excellent communication and report writing skills.
- Practical experience including distribution challenges, revenue management, credit control and metering
- Experience in electricity distribution sector in local government in South Africa
- Knowledge of legislation and regulations governing energy and electricity sector in the local government
- Strong social expertise in social inequality, gender dynamics, and related fields
- Proven experience in conducting socio-economic analysis of public policies affecting households, ideally in the energy or basic services sector, and in contexts involving informal settlements or vulnerable communities.
- Service providers should have grouping of both qualified Chartered Accountants and Electrical Engineers (Certified SAICA and ECSA, respectively) with knowledge of:
- Financial Management, auditing or internal audit
- Comprehensive knowledge and understanding of:
 - o The Municipal Finance Management Act (MFMA);
 - o Treasury Regulations;
 - o Division of Revenue Act (DoRA);
 - o Public Finance Management Act (PFMA)
 - o Electricity Regulation; and
 - o Inter-Governmental relations
- Proven CVs of consultants should be attached

10. BUDGET AND PAYMENT TERMS

A - Firm tranche

The budget for this tranche is EUR 165,000 (one hundred sixty five thousand euros) and payment will be made based on the completion of key milestones, as follows:

- Inception report – 5%
- Stakeholder engagement plan and draft report and action plan – 30%
- Completion of the workshop and submission of workshop report – 25%
- Comprehensive Final report and close out report – 40%

Municipal workshop report with inputs from the municipalities in the strategies and mechanisms to prevent illegal electrification and the main socio-economic drivers, including municipalities prioritized areas of action and generic action plan

B - Optional tranche

The budget for this tranche is EUR 50,000 (fifty thousand euros) and payment will be made based on the completion of key milestones, as follows:

- Draft report and action plan – 50%
- Final report and close out report – 50%

11. GOVERNANCE AND MONITORING

11.1. To facilitate the implementation and monitoring of this work, a steering committee will be set up and will be comprised of SALGA, COGTA, MISA, SANEDI and NT.

11.2. The steering committee will manage, monitor and oversee the project. This committee will ensure that:

- Services are rendered timeously.
- Deliverables and timelines are adhered to.;
- Will render a quality assurance function; and
- Will ensure that additional costs are not incurred unnecessarily.
- Oversee the overall project governance.

11.3. A project Oversight Committee will be put in place and be comprised of one member from each metropolitan and selected local municipality; one member from AMEU, and one member from SARPA. The role of this committee is to provide technical inputs, support service provider during the data collection process

11.4. The Service Provider will be expected to table progress reports for each deliverable contained in the implementation plan.

11.5. The deliverables and related payments will be approved by AFD , after the review and validation from the Steering Committee of the project.

12. LANGUAGES

12.1. The execution of the contract requires the permanent use of English in relations with AFD and the South African counterparts (documents, meetings, telephone calls, e-mails).

13. BID EVALUATION SYSTEM

<u>Price of the proposal:</u> Definition and assessment of the criterion: The maximum score (MS) will be awarded to the bidder who has submitted the lowest-priced financial offer. The other bidders will receive a score calculated using the following formula:	30/100
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• $S = MS \times (LBA / BUA)$ where: • S is the bidder's score, • LBA is the amount of the lowest bid, • BUA is the amount of the bid being evaluated.	
Quality of the methodology: Definition and assessment of the criterion: Quality and relevance of the proposed methodology for the implementation of the services	30/100
Quality of the proposed project team's profiles: Definition and assessment of the criterion: Quality of the profiles assigned to the execution of the services.	35/100
Environmental and Social responsibilities	5/100