
State of Digital Transformation with specific focus on the energy efficiency potential on energy demand in the Buildings Sector	Project number/ cost centre: 18.9022.7-004.00
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0. List of abbreviations

AVB	General Terms and Conditions of Contract for supplying services and work (2018)
AI/ML	Artificial Intelligence / Machine Learning
AR/VR	Augmented Reality/ Virtual Reality
DMRE	Department of Mineral Resources and Energy
4IR/5IR	4 th Industrial Revolution / 5 th Industrial Revolution
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IITPSA	Institute of Information Technology Professionals South Africa
OPC-UA	Open Platform Communications United Architecture
SANEDI	South African National Energy Development Institute
TOR	Terms of Reference

1. Context

Digitalization describes the growing application of information and communications technology (ICT) across economies throughout the world, leading to increasing volumes of data, rapid progress in advanced analytics, and resulting in greater connectivity between humans, devices and machines (including machine-to-machine). From sensors in commercial buildings to the rise of automated vehicles, digitalization has significant implications for how the world produces and consumes energy.

Digitalization's impact on the demand side of the energy industry is complex. On one hand, digital devices potentially offer large improvements in energy efficiency for the transport, buildings and industry sectors. On the other hand, the prevalence of more devices (and servers to house the data they produce), could cause increases in energy use, if not managed carefully. However, the rapid process of digitalization is unlikely to stop, even though South Africa is still in the beginning stages of this new global development. The key challenge for policy makers is to steer the digitalization process in a way that maximises the benefits for the energy system and minimise any possible negative impacts. Digitalization does however, offer the potential to increase energy efficiency through technologies that gather and analyse data, before using it to make changes to the physical environment (either automatically or through human intervention).

There is no doubt that the concept and evolution of digitalization, as an energy efficiency instrument, will revolutionise the future way we design, implement and monitor energy efficiency interventions in South Africa and all over the world. The International Energy Agency, Germany and many other countries, both large and small, are embracing this 'new' way of optimising the energy efficiency potential across all market sectors, including residential, industrial, commercial, agriculture and transport sectors. South Africa is fully aware of these developments and there are 'pockets' of activity taking place in the country, e.g., through home automation interventions, robotics within the mining and automotive production facilities, but we are lacking a clear plan on what the real energy efficiency benefits are (energy efficiency potential), the best-in-class digital technologies available in the local market and what policy and regulatory instruments will need to be developed, to cater for this 'new' way of doing things.

The South African – German Energy Partnership¹, in collaboration with the South African National Energy Development Institute (SANEDI)² is aiming to commission a series of studies focusing on three South African sectors (buildings, industry, mining). The three sectors are

¹ The **South African-German Energy Partnership**, implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) was set up in 2013 between the German Ministry of Economic Affairs and Energy and the South African Department of Mineral Resources and Energy. Additional key stakeholders involved are further government departments (e.g., Department of Trade, Industry and Competition, Department of Science and Innovation), as well as German and South African private sector representatives. The Energy Partnership combines political exchange with practical project work focusing on four activity fields: (1) Intergovernmental dialogue on energy policy with partner countries (2) Advice on policy for the global energy transition (3) Cooperation with the private sector, academia and civil society, as well as (4) Communication and knowledge management.

² The **South African National Energy Development Institute (SANEDI)**, was established in 2011 under the National Energy Act, of 2008. The Act provides for SANEDI to direct, monitor and conduct energy research and development, promote energy research and technology innovation as well as undertake measures to promote energy efficiency throughout the economy.

chosen based on high energy intensity, being a focus and priority in the South African energy industry. The studies shall assess the current digital maturity and the regulatory framework of the sector, outline the energy efficiency potential (reduction on energy demand) through the application of digital technologies and deduct recommendations of actions for policy makers on how to leverage the identified potential.

To initiate the series of studies, the South African – German Energy Partnership in collaboration with SANEDI wishes to initially appoint a service provider to conduct a study on the buildings sector. The buildings sector in this regard would include commercial and office (public and private) buildings. Ultimately, SANEDI will use the information generated by the study to inform and advise the Department of Mineral Resources and Energy (DMRE) in its policy-making decisions.

2. Tasks to be performed by the contractor

The scope of work for this assignment is outlined below (note that the time estimates are based on a team of three professionals working on the tasks):

a. Inception phase (10 days)

- i. Develop research methodology with appropriate data collection methods.
- ii. Align on draft research methodology, incl. data collection instruments and the data collection methodology with GIZ during kick-off meeting. A representative sample of commercial and office buildings for the South African analysis must be proposed by the service provider as part of research methodology.
- iii. Prepare for and attend kick-off meeting (to be defined whether virtual or physical) with GIZ, SANEDI and possibly DMRE to present the proposed methodology.

b. Data collection phase - global analysis (22 days)

The global analysis should be limited to three countries that are advanced in applying digital technologies for energy efficiency purposes in the buildings sector. These could include but not limited to, Germany, Sweden and the USA.

- i. Provide an overview of the **key market forces driving change** in the global buildings sector. These should include but are not limited to the areas of sustainability, decarbonisation, new business models and digitalisation.
- ii. Provide an overview of the **digital trends** and outline the **impact** of digital transformation in the global buildings sector in regards to energy efficiency.
- iii. Provide an overview of the **key technologies** behind the digital trends.
- iv. Provide an overview of the **state of digital adoption/digital maturity** of the global buildings sector.
- v. Provide an overview of the **top digital solution providers** in the digital buildings space with a South African presence, including their value proposition, key activities and target customer segments.

c. Data collection phase - South African analysis (30 days)

- i. **As-Is Situation:** Provide an overview of:
 - a. the digital adoption/ digital maturity in the buildings sector in South Africa from a private and public sector regulatory framework perspective.
 - b. the digital trends in the South African buildings sector.

- c. review the existing regulatory framework/ national strategic documents and assess the potential impact of COVID-19 on the developments.
- ii. **To-Be potential:** Compile the key opportunities of digitalisation for the buildings sector, focussing on energy efficiency/savings potential and additional job opportunities.

d. Data analysis phase (33 days)

Transform data into usable insights as per the scope listed in B above and deduct recommendations of action: Based on the analysed as-is situation and the to-be potential, propose key success factors (e.g., policy requirements, infrastructure requirements, governance structures) and recommendations of action for key decision makers, by utilizing lessons learnt from other countries (benchmarks) where possible. Split the study recommendations between nice to know (purely informative) and actionable for direct support of the policy decision making process.

e. Report writing and submission phase (33 days)

- i. Compile a draft report outlining the findings of the study in an iterative feedback process with GIZ and SANEDI every two weeks on the working status of the report.
- ii. Present the study findings and recommendations to GIZ, SANEDI and DMRE.
- iii. Based on feedback received on the draft report and presentation discussion, compile a final report with executive summary (submitted in Word).
- iv. Prepare and present the results of the study at the Industry Workshop and incorporate key comments made in relation to the study findings into the final report.
- v. Prepare an article summarising the main results and recommendations from the study for publication in a suitable journal.
- vi. Prepare a PowerPoint presentation and a short executive summary that contains the main results and recommendations from the study. The original data must be provided in Microsoft programmes. Note that all publications must adhere to GIZ corporate design standards.

Certain milestones, as laid out in the table below, are to be achieved by certain dates during the contract term:

Milestone	Deadline/place/person responsible
Develop methodology and approach to share within the kick-off meeting (task 2a) including participating in the meeting.	First two weeks of September 2021
Collect data utilising agreed methodology and data analysis (tasks 2b, c & d).	Mid-September until end-November 2021
Prepare and present draft report to Client (task 2e).	10 December 2021
Submission of comments by the Client.	14 January 2022
Present study results at industry workshop.	25 January 2022

Submit final report and supporting documents (power point presentation, executive summary and article).	01 February 2022
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Period of assignment: Six (6) months anticipated to be from September 2021 to February 2022.

3. Concept

In the bid, the bidder is required to show how the objectives defined in Chapter 1 are to be achieved, if applicable under consideration of further specific method-related requirements (technical-methodological concept). In addition, the bidder must describe the project management system for service provision.

a. Technical-methodological concept

Strategy: The bidder is required to consider the tasks to be performed with reference to the objectives of the services put out to tender (see Chapter 1). Following this, the bidder presents and justifies the strategy with which it intends to provide the services for which it is responsible (see Chapter 0).

The bidder is required to present the actors relevant for the services for which it is responsible and describes the **cooperation** with them.

The bidder is required to present and explain its approach to **steering** the measures with the project partners and its contribution to the results-based monitoring system.

The bidder is required to describe the key **processes** for the services for which it is responsible and create a schedule that describes how the services according to Chapter 0 are to be provided. In particular, the bidder is required to describe the necessary work steps and, if applicable, take account of the milestones and contributions of other actors in accordance with Chapter 0.

The bidder is required to describe its contribution to knowledge management for the partner and GIZ and promote scaling-up effects (**learning and innovation**).

b. Other specific requirements

None

c. Project management of the contractor

The bidder is required to explain its approach for coordination with the GIZ project.

- The contractor makes available equipment and supplies (consumables) and assumes the associated operating and administrative costs.
- The contractor manages costs and expenditures, accounting processes and invoicing in line with the requirements of GIZ.
The contractor reports regularly to GIZ in accordance with the AVB of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH from 2018

The bidder is required to draw up a **personnel assignment plan** with explanatory notes that lists all the experts proposed in the bid; the plan includes information on assignment dates (duration and expert days) and locations of the individual members of the team complete with the allocation of work steps as set out in the schedule.

The bidder is required to describe its backstopping/support concept. The following services are part of the standard backstopping package, which (like ancillary personnel costs) must be factored into the fee schedules of the staff listed in the bid in accordance with section 5.4 of the AVB:

- Service-delivery control
- Managing adaptations to changing conditions
- Ensuring the flow of information between GIZ and field staff
- Contractor's responsibility for seconded personnel
- Process-oriented technical-conceptual steering of the consultancy inputs
- Securing the administrative conclusion of the project
- Ensuring compliance with reporting requirements
- Providing specialist support for the on-site team by staff at company headquarters
- Sharing the lessons learned by the contractor and leveraging the value of lessons learned on site.

4. Personnel concept

The bidder is required to provide personnel who are suited to filling the positions described, based on their CVs (see Chapter 7), the range of tasks involved and the required qualifications.

The below specified qualifications represent the requirements to reach the maximum number of points.

a. Team leader

Tasks of the team leader

- Overall responsibility for the advisory packages of the contractor (quality and deadlines);
- Coordinating and ensuring communication with GIZ, partners and others involved in the project;
- Participate in regular meetings with GIZ and partners;
- Regular reporting in accordance with deadlines;
- Personnel management, in particular identifying the need for short-term assignments within the available budget, as well as planning and steering assignments and supporting local and international short-term experts;
- Input into design of study methodology and data collection instruments;
- Support data collection and analysis process;
- Support the compilation of the final report, and overall responsibility for the delivery of all outputs associated with the contract;
- Participation in and presentation at an industry workshop to present the findings of the report. Note that costs associated with the workshop organisation and hosting should not be included in the bid.

Qualifications of the team leader

- Education/training (2.1.1): University qualifications (Masters' degree) in Engineering, Electronics, Business Administration, Economics or similar.

- Language (2.1.2): Good business language skills in English.
- General professional experience (2.1.3): 5 years of professional experience in the energy sector particularly energy efficiency.
- Specific professional experience (2.1.4): 2 years of experience in business analysis activities (e.g. research, data analytics, report writing and project management) in the energy sector.
- Leadership/management experience (2.1.5): 3 years of management/leadership experience as project team leader or manager in a company.
- Regional experience (2.1.6): none in projects in Southern Africa (region), and up to 2 years in energy efficiency projects in South Africa.
- Development cooperation experience (2.1.7): none
- Other (2.1.8): one project that demonstrates understanding of global energy efficiency and digital transformation.

b. Short-term expert pool with minimum one (1), maximum two (2) members

Tasks of the short-term expert pool

- At the discretion of the team leader, participate in regular meetings with GIZ and partners;
- Undertake data collection and analysis;
- Support the compilation of the final report and supporting documentation.

Qualifications of the short-term expert pool

- Education/training (2.6.1): University qualification in Engineering, Electronics, ICT related studies and/or Business Analytics
- Language (2.6.2): experts with good language skills in English
- General professional experience (2.6.3): 3 years of experience in the energy sector, of which 1 year professional experience in energy efficiency.
- Specific professional experience (2.6.4): 1 year of experience in digital trends/ applications and transformation.
- Regional experience (2.6.5): none in Southern Africa (region), and 1 year in South Africa (country).
- Development cooperation experience (2.6.6): none
- Other (2.6.7): none

The bidder must provide a clear overview of all proposed short-term experts and their individual qualifications.

Soft skills of team members

In addition to their specialist qualifications, the following qualifications are required of team members:

- Team skills
- Analytical skills
- Communication skills
- Socio-cultural competence
- Efficient, partner- and client-focused working methods
- Inter-disciplinary thinking
- Report writing skills

5. Costing requirements

a. Assignment of personnel

Team leader: On-site assignment for 48 expert days

Pool of experts: Assignment in country of assignment for 80 expert days

b. Travel

The bidder is required to calculate the travel by the specified experts and the experts it has proposed based on the places of performance stipulated in Chapter 0 and list the expenses separately by daily allowance, accommodation expenses, flight costs and other travel expenses.

- Flight costs – up to 4 flights
- Accommodation – up to 10 nights
- Car Hire – up to 5 days
- Mileage – up to 3000 kilometres
- Per Diem – up to 10 days

c. Workshops, training

In relation to Task 2(e)(iv) the service provider is not expected to incur any cost related to organizing and hosting the industry workshop. GIZ and SANEDI will cover the costs associated with the workshop where the final report will be presented.

d. Other costs

Any travel logistics and costs implications required and linked to the industry workshop should be discussed and negotiated with GIZ and SANEDI in advance.

e. Flexible remuneration item

A flexible remuneration of up to 78.220,00 ZAR is foreseen and its use is subject to approval by GIZ.

6. Inputs of GIZ or other actors

None.

7. Requirements on the format of the bid

The structure of the bid must correspond to the structure of the ToRs. In particular, the detailed structure of the concept (Chapter 3) is to be organised in accordance with the positively weighted criteria in the assessment grid (not with zero). It must be legible (font size 11 or larger) and clearly formulated. The bid is drawn up in English.

The complete bid shall not exceed 10 pages (excluding CVs).

The CVs of the personnel proposed in accordance with Chapter 4 of the ToRs must be submitted using the format specified in the terms and conditions for application. The CVs shall not exceed 2 pages. The CVs must clearly show the position and job the proposed person held in the reference project and for how long. The CVs must also be submitted in English.

If one of the maximum page lengths is exceeded, the content appearing after the cut-off point will not be included in the assessment.

Please calculate your price bid based exactly on the aforementioned costing requirements. In the contract the contractor has no claim to fully exhaust the days/travel/workshops/ budgets. The number of days/travel/workshops and the budget amount shall be agreed in the contract as 'up to' amounts. The specifications for pricing are defined in the price schedule.

Other Requirements

- Please submit your proposal (technical and price proposal) in separate files/folder to ZA_Quotation@giz.de no later than 30.07.2021, 23h00 all documents must be in PDF.
- Please do not mention any price for this measure on your cover letter/Technical proposal.
- Please submit your tax clearance certificate with the bidding documents.
- Please submit your price proposal in LSL
- Our General Terms of Conditions (attached) shall not be changed/amended should you be the winner of this tender. These General Terms and Conditions will form part of the contract should you be awarded this contract. By submitting your proposal we will conclude that you have read and accepted these terms and conditions.
- Participating more than once in same tender is not allowed and it will lead to your proposal as well as that of the company where you appear more than once being disqualified. The responsibility rests with the companies to ensure that their partners/experts are not bidding/participating more than once in same tender.
- **Bidders are not allowed to communicate directly with any other person regarding this bid other than the procurement official/s. Failure to comply with this requirement may lead to your bid being disqualified.**
- Bidders must strictly avoid conflicts with other assignments or their own interests. Bidders found to have a conflict of interest shall be disqualified. Without limitation on the generality of the above, Bidders, and any of their affiliates, shall be considered to have a conflict of interest with one or more parties in this EOI and tender process, if they:
 - a) are or have been associated in the past, with a firm or any of its affiliates which have been engaged by GIZ or the Interim Supply Chain Management Council to provide services for the preparation of the design, specifications, Terms of Reference, cost analysis/estimation, and other documents to be used for the procurement of the services in this selection process;

- b) were involved in the preparation and/or design of the programme/project related to the services requested under this EOI and tender;
 - c) are serving or have been serving in the past three months in the structures of the Interim Supply Chain Management; or
 - d) are found to be in conflict for any other reason, as may be established by, or at the discretion of GIZ.
- In the event of any uncertainty in the interpretation of a potential conflict of interest, Bidders must disclose to GIZ, and seek GIZ's confirmation on whether or not such a conflict exists.
 - Similarly, the Bidders must disclose in their proposal their knowledge of the following:
 - a. if the owners, part-owners, officers, directors, controlling shareholders, of the bidding entity or key personnel are family members of GIZ staff involved in the procurement functions and/or the Interim SCM Council or any Implementing partner receiving services under this EOI or tender; and
 - b. all other circumstances that could potentially lead to actual or perceived conflict of interest, collusion or unfair competition practices.
- **Failure to disclose such an information may result in the rejection of the proposal or proposals affected by the non-disclosure.**
 - **Questions & Answers will be placed on the link provided.**

Bids sent via Dropbox and WeTransfer will not be accepted