

Terms of reference (ToRs) for the procurement of services below the EU threshold

Impact Analysis of Critical Raw Materials' Mining and Use for the Green Hydrogen economy in South Africa	Project number/ cost centre: 21.2230.7-003.00
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0. List of abbreviations

AVB/GTCC	General Terms and Conditions of Contract for supplying services and work 2022
BMZ	German Federal Ministry for Economic Cooperation and Development
DC	Development Cooperation
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GH2	Green Hydrogen
GHSA	Green Hydrogen South Africa
H2.SA	Promoting a Green Hydrogen Economy in South Africa
STE	Short-term expert
PtX	Power-to-X (Green hydrogen-based products)
ToRs	Terms of reference

1. Context

Critical minerals/raw materials play a significant role in the production of key components of green hydrogen technologies such as electrolyzers and fuel cells. Some examples of critical minerals commonly used in electrolyzers and fuel cells include Platinum Group of Metals (PGMs) such as Platinum, Palladium and Rhodium; Nickel, Titanium, Graphite, Cobalt and Ruthenium. The efficient operation and performance of electrolyzers and fuel cells depends on these critical minerals. With the rising global demand for green hydrogen therefore, the responsible sourcing and utilising of these minerals is an important consideration for sustainable green hydrogen sector.

The World Bank¹ estimates that hydrogen needs to grow seven-fold to support the global energy transition, eventually accounting for 10 percent of total global energy consumption by 2050. This magnitude of scaleup of hydrogen production means an associated increase in demand for critical raw materials needed to support hydrogen technologies such as electrolyzers for renewable hydrogen or fuel cells using hydrogen to power transport. The range of critical minerals for the green hydrogen sector may include aluminium, copper, iridium, nickel, platinum, vanadium and zinc.

Developing a green hydrogen economy, aimed at reducing carbon emissions and advancing sustainable energy solutions for South Africa's domestic and export demands, would rely on increased critical minerals needed for key components such as electrolyzers and fuel cells.

While South Africa does not have substantial mining operations for all the critical minerals needed for the manufacture of electrolyzers, fuel cells and batteries, the country produces some of them and has potential to produce other critical minerals. Some of the critical minerals in SA that are relevant for green hydrogen/PtX production technologies include platinum group of metals (PGMs), Nickel (Ni), Cobalt (Co), Manganese (Mn), Vanadium (V), Lithium (Li), Graphite (C), and Rare Earth Elements (REEs). South Africa is a major producer of PGMS such as platinum, palladium and rhodium which are particularly essential in the catalysts used in proton exchange membrane (PEM) fuel cells. Approximately 72 percent of global platinum production originates from South Africa (USGS, 2022).

Achieving South Africa's GH2 production target for its export and domestic use ambitions by 2050 requires an associated increase in critical minerals mining. Understanding the magnitude of the critical minerals demand and associated potential environmental and social impacts of the anticipated increased mining activity in the mining areas and across the GH2 value chain as well as mitigation measures for negative impacts would be important for ensuring sustainable mining in the sector.

Objective

These Terms of Reference (TOR) seek the services of a service provider to conduct an assessment/study – whose main objective is to develop actionable insights and recommendations for the mining industry, policymakers, and other stakeholders to ensure

¹ *Moreira S, Laing T, 2022. Sufficiency, sustainability, and circularity of critical materials for clean hydrogen. Climate-Smart Mining Facility.*

promotion of sustainable sourcing and utilization of critical minerals. This means the mining and use of the critical minerals would align with environmental conservation, social well-being, and long-term economic viability. This objective would in turn promote the sustainable development of other industries dependent on these critical minerals such as renewable energy, electric vehicles and electronics.

2. Tasks to be performed by the contractor

The contractor is responsible for providing the following services:

- Proposing improvements to the activities to enhance the results of the study towards meeting the objective.

Work packages and Activities

Work package	Activity	Deliverables (D), Outputs & timelines
1. Inception & Kick-off	1a. Organise a kick-off meeting with GIZ's Project Management Team (PMT) within 1 week of signing contract. The contractor will organise regular (e.g., monthly) project management meetings (PMT) to provide project status updates to the GIZ project colleagues.	Kick off meeting <u>15.12.2023</u>
	1b. Prepare and submit inception report along with the workplan. The report should detail the methodology, tasks and activities to be undertaken along with the workplan. Include proposed resource allocation for the tasks	D1. Inception report & Workplan <u>20.12.2023</u>
2. Assess potential environmental impacts of extracting critical minerals in South Africa's mines	2a. Assess/Review critical minerals produced in South Africa and provide a map of South Africa showing where the minerals are produced /mined. Overlay important environmental features and social demographics on map where possible e.g. population density, land cover, biodiversity, etc. Also assess and provide a brief description (2 - 4 pages) of important information to further explain/describe the features and general details in the map. Information should include population demographics/characteristics, water sources to mines, energy/electricity source to mine, (e.g. employment, gender, age, schools, etc.	D2. Map & description of critical minerals in SA <u>14.03.2024</u>

	(Update map with information from findings in other activities/work packages, where applicable.)	
	<p>2b(i). Assess the expansion of mining of critical minerals connected to Hydrogen. This assessment would cater for two scenarios – a low demand, and high demand scenario of critical minerals for South Africa’s green hydrogen economy. The consultant will develop to plausible scenarios for this assessment.</p> <p>2b(ii) With the above scenarios as the basis, Evaluate from literature, and stakeholder engagements, the potential environmental effects of critical minerals extraction and use for green hydrogen technologies in South Africa. This should include evaluation of water usage, energy consumption, land disruption, and greenhouse gas emissions. The impacts should be assessed by anticipated level/magnitude of mining activity of the specific critical minerals.</p>	
	2c. Analyse potential pollution and contamination risks associated with critical minerals mining activities and their impact on local ecosystems and biodiversity.	
3. Examine Social, human rights and socio- economic impact.	3a. Investigate potential positive and negative social issues such as labour conditions, human rights violations, and community displacement associated with critical minerals mining. This may involve review of literature including the mining charter (2018), speaking to mining industries and civil society organisations that represent the interests of mining communities such as Mining Affected Communities United Action (MACUA).	
	3b. Assess the involvement of local communities and indigenous populations in decision-making processes related to mining activities. The consultant should derive information from civil society organisations representing mining communities, as well as from industries/literature – on how they involve the communities are involved.	

	<p>3c. Examine the economic benefits and drawbacks of critical minerals mining for green hydrogen technologies, including job creation, revenue generation, and contributions to regional economies.</p> <p>Draft the analysis report combining results from work packages 2 and 3.</p>	
4. Risk and opportunities identification of critical minerals supply chains	<p>4a. Investigate the security and resilience of critical minerals supply chains that may affect/impact South Africa’s green hydrogen sector, considering for example geopolitical risks, trade dependencies, and potential supply disruptions.</p>	
	<p>4b. Identify opportunities to diversify and strengthen supply chains for SA’s critical minerals to ensure a stable and reliable source of critical minerals, so as to not disrupt green hydrogen production in SA.</p>	<p>D3: Analysis Report: Environmental & Social Impacts of Critical Minerals Extraction & use in South Africa’s GH2 economy</p> <p><u>16.06.2024</u></p>
	<p>4c. <u>Workshop & Information session x 2</u> to validate the results of the study. Include relevant stakeholder such as civil society representatives in those areas (e.g., MACUA)</p>	<p>Workshops x 1</p> <p>Information session x 2</p> <p><u>(June - August 2024)</u></p>
5. Review & recommend sustainable practices for critical minerals extraction and utilisation	<p>5a. Identify and propose good practices as well as innovative technologies for responsible critical minerals extraction that would minimize negative environmental and social impacts.</p>	
	<p>5b. Briefly review and highlight from literature any technological advancements and alternatives to help reduce the reliance on critical minerals and promote sustainability. Examples of such advancements may include diversifying by developing new catalysts or materials for electrolyzers and fuel cells.</p>	

	5c. Recommend strategies for optimizing critical minerals utilization, reducing waste generation, and promoting circular economy principles.	
	5d. Explore the potential of recycling and reusing critical minerals from end-of-life components	Update Analysis report with workshop feedback & 5a-5d information.
6. Recommendations	<p>Develop actionable insights and recommendations for the mining industry, policymakers, and other stakeholders to ensure promotion of sustainable sourcing and utilization of critical minerals. Include in Impact analysis report and Policy brief. Consider dissemination of policy brief.</p> <p>Design of report & policy brief (consult GIZ for support)- do not budget for this.</p> <p>Power point summary suitable as training material: The consultant will in addition develop a power point summary of the critical minerals insights in a format that can be used as training material. The power point slide deck will provide a basis for including in trainings suited to Power-to X and Green Hydrogen training content (e.g. to be considered for possible use by PtX Hub).</p>	<p>D4. Policy Brief</p> <p>&</p> <p>Updated Analysis Report (with Executive summary)</p> <p>&</p> <p>Short Power Point Summary</p> <p>20.09.2024</p>
7. Project closure	Final project documentation (submission of outstanding information) and closure	31.10.2024

In addition to the reports required by GIZ in accordance with the AVB, the contractor submits the following reports:

- Inception report and workplan
- Analysis report

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

Milestones/process steps/partial services	Deadline/place/person responsible
Kick off meeting	1 week of signing contract 15.12.2023
D1: Inception Report & Workplan	20.12.2023
D2: Map & description of critical minerals in SA	14.03.2024

D3: Analysis Report	16.06.2024
D4: Policy Brief & Updated Analysis Report	20.09.2024
Final documentation & closure	31.10.2024

Period of assignment: from **15.12.2023** until **15.12.2024**.

3. Concept

In the tender, the tenderer is required to show *how* the objectives defined in Chapter 2 (Tasks to be performed) are to be achieved, if applicable under consideration of further method-related requirements (technical-methodological concept). In addition, the tenderer must describe the project management system for service provision.

Note: The numbers in parentheses correspond to the lines of the technical assessment grid.

Technical-methodological concept

Strategy (1.1): The tenderer is required to consider the tasks to be performed with reference to the objectives of the services put out to tender (see Chapter 1 Context) **(1.1.1)**. Following this, the tenderer presents and justifies the explicit strategy with which it intends to provide the services for which it is responsible (see Chapter 2 Tasks to be performed) **(1.1.2)**.

The tenderer is required to present the actors relevant for the services for which it is responsible and describe the **cooperation (1.2)** with them.

The tenderer is required to describe the key **processes** for the services for which it is responsible and create an **operational plan** or schedule **(1.4.1)** that describes how the services according to Chapter 2 (Tasks to be performed by the contractor) are to be provided.

Project management of the contractor (1.6)

The tenderer is required to explain its **approach for coordination (1.6.1)** with the GIZ project. In particular, the project management requirements specified in Chapter 2 (Tasks to be performed by the contractor) must be explained in detail.

The tenderer is required to draw up a **personnel assignment plan (1.6.2)** with explanatory notes that lists all the experts proposed in the tender; the plan includes information on assignment dates (duration and expert months) and locations of the individual members of the team complete with the allocation of work steps as set out in the schedule.

Further requirements (1.7)

The service provider will indicate in the bid, consideration of gender equality and participation during implementation of the study.

4. Personnel concept

The tenderer is required to provide personnel who are suited to filling the positions described, on the basis of 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 in the technical assessment.

Team leader

Tasks of the team leader

- Overall responsibility for the advisory packages of the contractor/consultant (quality and deadlines)
- Coordinating the project team and ensuring communication with GIZ, partners and others involved in the project
- Personnel management, in particular identifying the need for short-term assignments within the available budget, as well as planning and steering assignments and supporting the short-term experts.
- Coordination of project work packages and related activities
- Lead cooperation with all relevant stakeholders (incl. organisation of interviews, meetings, workshops/information sessions)
- Coordination and convening of meetings with GIZ project team, in support of the Team leader
- Regular reporting in accordance with deadlines
- Responsibility for checking the use of funds and financial planning in consultation with the officer responsible for the commission at GIZ

Qualifications of the team leader

- Education/training (2.1.1): University degree (Master) in Environmental Sciences, Natural Sciences, Engineering, Social Sciences, or Political Sciences or Geography
- Language (2.1.2): C1-level language proficiency (according to the Common European Framework of Reference for Languages i.e. CEFR) in English
- General professional experience (2.1.3): 8 years of professional experience in the environment or mining sector
- Specific professional experience (2.1.4): 4 years in conducting environmental and social impact analyses
- Leadership/management experience (2.1.5): 5 years of management/leadership experience as project team leader or manager in a company
- Regional experience (2.1.6): 2 years of experience in projects in Southern Africa & SADC (region) (5 out of 10 points), of which 2 years in projects in South Africa (5 out of 10 points)
- Development cooperation (DC) experience (2.1.7): 1 year of experience in DC projects
- Other (2.1.8): 2 policy briefs or written recommendations to decision makers from the public sector.

Key expert 1: Environment and Sustainability Expert

Tasks of key expert 1

- Provide expert insights during research, and project implementation on aspects of environmental and sustainability impacts of mining.
- Provide expert support to the team to ensure quality of the key research /knowledge products on environment and sustainability in this assignment.

Qualifications of key expert 1

- Education/training (2.2.1): University degree (Master or equivalent) in Environmental or Natural Sciences, Political Sciences, Social Sciences, Engineering or Regional Studies

- Language (2.2.2): C1 -level language proficiency according to the Common European Framework of Reference for Languages (CEFR) in English
- General professional experience (2.2.3): 6 years in environmental sustainability projects
- Specific professional experience (2.2.4): 3 years in renewables (5 out of 10 points), 3 years in environment projects including in mining experience
- Leadership/management experience (2.2.5): 3 years as project team lead or manager of a company
- Regional experience (2.2.6): 4 years experience in South Africa
- Development Cooperation (DC) experience (2.2.7): 2 years working in development cooperation projects

Short-term expert pool with minimum 2, maximum 3 members

For the technical assessment, an average of the qualifications of all specified members of the expert pool is calculated. Please send a CV for each pool member (see below Chapter 7 Requirements on the format of the bid) for the assessment.

Tasks of the short-term expert pool

- Carrying out the tasks in coordination with and under the guidance of the team leader and the project coordinator
- Presentation of partial results together with the project coordinator and/or team leader

Qualifications of the short-term expert pool

- Education/training (2.6.1): All experts with university qualification (Master) in Engineering, or Environmental Sciences or Natural Sciences, or Political Sciences or Social Sciences or Regional Studies
- Language (2.6.2): All experts with C1-level language proficiency (according to the Common European Framework of Reference i.e. CEFR) in English
- General professional experience (2.6.3): 1 expert with 4 years of professional experience in the mining sector, all other 1 expert with 4 years of professional experience in materials science
- Specific professional experience (2.6.4): 1 expert with 1 year of professional experience in green Hydrogen/ Power-to-X, 1 expert with 4 years of professional experience in conducting environmental and social impact analyses, 1 expert with 3 years of professional experience in economic analysis in supply chains ,
(Please Note: One expert can fulfil several points. Please indicate the specific experience of each expert in the bid)

Soft skills of team members

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

- Team skills
- Initiative
- Communication skills
- Socio-cultural skills
- Efficient, partner- and client-focused working methods
- Interdisciplinary thinking

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

5. Costing requirements

Assignment of personnel and travel expenses

Accommodation costs and the cost of flights and other main forms of transport can be reimbursed against evidence

All business travel must be agreed in advance by the officer responsible for the project.

Sustainability aspects for travel

GIZ would like to reduce greenhouse gas emissions (CO₂ emissions) caused by travel. When preparing your tender, please incorporate options for reducing emissions, such as selecting the lowest-emission booking class (economy) and using means of transport, airlines and flight routes with a higher CO₂ efficiency. For short distances, travel by train (second class) or e-mobility should be the preferred option.

If they cannot be avoided, CO₂ emissions caused by air travel should be offset. GIZ specifies a budget for this, through which the carbon offsets can be settled against evidence.

There are many different providers in the market for emissions certificates, and they have different climate impact ambitions. The [Development and Climate Alliance \(German only\)](#) has published a [list of standards \(German only\)](#). GIZ recommends using the standards specified there.

Specification of inputs

Fee days	Number of experts	Number of days per expert	Total	Comments
Team Leader	1	24	24	Total days
Expert 1: Environmental & Sustainability Expert	1	32	32	Total days
Short-term expert pool	2 to 4	60	60	Total days
Travel expenses	Quantity	Price	Total	Comments
Per-diem allowance in country of assignment	60			
Overnight allowance in country of assignment	60			
Transport	Quantity	Price	Total	Comments
Domestic flights	8			Flights within the country of assignment during service delivery

CO₂ compensation for air travel <i>Link to working aid and table for determining the budget and Guidance for GIZ service providers on avoiding, reducing and offsetting GHG emissions on setting the budget.</i>	8			A budget is earmarked for settling carbon offsets against evidence.
Travel expenses (train, car) <ul style="list-style-type: none"> • Car travel (mileage) • Car hire • Train • E-hailing (e.g. UBER) • Toll fees 				Travel within the country of assignment, transfer to/from airport etc.
Other costs	Number	Price	Total	Comments
Flexible remuneration	1			A budget of ZAR 146,988.00 is foreseen for flexible remuneration. Please incorporate this budget into the price schedule. Use of the flexible remuneration item requires prior written approval from GIZ.
Workshops/Information event Printing (workshop material, reports)	3 lumpsum			The budget contains the following costs: <ul style="list-style-type: none"> • venue hire • PA system • catering • parking • printing as indicated

Workshops and training

Please describe in your concept how you implement GIZ's minimum standards for sustainable event management (see annexes to the terms of reference).

The contractor implements the following workshops/study trips/training courses:

- 1 x workshop
- 2 x information events

Events should preferably be in-person, and may be linked to other H2.SA or energy sector events.

6. Inputs of GIZ or other actors

GIZ and/or other actors are expected to make the following available:

- Support stakeholder identification for the study
- Meeting rooms for in person meetings at GIZ premises
- Logistics for workshops: GIZ can provide project banners, participant registration lists, feedback forms (to support assessment of workshops/information events)

7. Requirements on the format of the tender

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

The complete tender must not exceed 10 pages (excluding CVs). If one of the maximum page lengths is exceeded, the content appearing after the cut-off point will not be included in the assessment. External content (e.g. links to websites) will also not be considered.

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 4 pages each. They must clearly show the position and job the proposed person held in the reference project and for how long. The CVs can also be submitted in English (language).

Please calculate your financial tender based exactly on the parameters specified in Chapter 5 Quantitative requirements. The contractor is not contractually entitled to use up the days, trips, workshops or budgets in full. The number of days, trips and workshops and the budgets will be contractually agreed as maximum limits. 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 **01.12.2023** 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 ZAR.
- 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.

Scientific data

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.**

8. Annexes

- H2.SA Project Factsheet
- Minimum standards for sustainable event management at GIZ