

Request for Proposals (RFP)

The provision of services in development of Industrial Green Hydrogen Systems and Green Hydrogen Safety and Handling Training Course Materials on behalf of the CSIR

RFP No. 1065/30/01/2023

Date of Issue	Thursday, 15 December 2022	
Compulsory Briefing and Site Inspection	None	
Closing Date	Monday, 30 January 2023 at 16h30	
Enquiries and submission of proposals	Strategic Procurement Unit	E-mail: tender@csir.co.za
CSIR business hours	08h00 – 16h30	
Category	Professional Services	

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SECTION A – TECHNICAL INFORMATION

1 INTRODUCTION

The Council for Scientific and Industrial Research (CSIR) is one of the leading scientific research and technology development organisations in Africa. In partnership with national and international research and technology institutions, CSIR undertakes directed and multidisciplinary research and technology innovation that contributes to the improvement of the quality of life of South Africans. The CSIR's main site is in Pretoria while it is represented in other provinces of South Africa through regional offices.

This work is commissioned by the National Cleaner Production Centre, South Africa (NCPC-SA), as part of its commitment in the areas of climate change, sustainable development, and resource efficiency. The focus of this work is the development of a Green Hydrogen curriculum and related training material, including slides, manuals and training aids for 1-day Introductory courses, as well as 2-Day End User training courses for industrial and commercial sector applications. The purpose is to raise awareness and start developing capacity of energy engineers and practitioners to evaluate, identify and implement green hydrogen solutions as a key component of the future energy mix in many large industrial plants. The training material developed according to request for proposal will be used to capacitate and develop a national base of green hydrogen practitioners to promote its application in the industrial and commercial sectors. The Introductory material needs to be developed with for the following distinctively different target audiences:

- a) Executive decisionmakers that do not need detailed technical knowledge, but rather legislative, regulatory, and economic aspects; and
- b) Communities surrounding and supporting the potential Hydrogen infrastructure that needs to understand the potential socio-economic impact on their lives and their environment, including opportunities for up-skilling, re-skilling, and potential growth of employment opportunities.

Both the Introductory courses should not only raise awareness, inform, and enhance knowledge, but also increase understanding of the technology.

2 BACKGROUND

Hydrogen presents a significant opportunity for economic development in South Africa, including the creation of new jobs and the monetization of the platinum industry. It is also a contributor to South Africa's decarbonization objectives, leveraging PP1, REDZ2 and other renewable development programs to produce green hydrogen, now at the centre of many sector-level green strategies (e.g., green steel, green buildings).

Finally, global commitments towards hydrogen production and demand create an opportunity for South Africa to engage in energy export at the international level. The South African Government's Department of Science and Innovation (DSI), in partnership with Anglo-American, Bambili Energy and ENGIE are looking into opportunities to transform the Bushveld complex and larger region around Johannesburg, Mogalakwena and Durban into a Hydrogen Valley.

To realize these objectives for South Africa, Hydrogen Valleys can be leveraged to kickstart the hydrogen economy, leading to cost savings through shared infrastructure investments, improving the cost competitiveness of hydrogen production through economies of scale, enabling a rapid ramp-up of hydrogen production within a given territory, and leveraging an incubator for new pilot hydrogen projects. Three catalytic green hydrogen hubs have been identified in South Africa's Hydrogen Valley. These hubs have been identified based on locations with potential for a high concentration of future hydrogen demand, the possibility to produce hydrogen (e.g., access to sun/wind, water infrastructure), and contributions to the just transition—an economic development plan that brings positive social impact particularly to more fragile groups and communities. These hubs – that may include Johannesburg, Durban/Richards Bay, Mogalakwena/Limpopo, Coega and Saldanha bay – will host pilot projects and contribute to the launch the hydrogen economy in the Hydrogen Valley.

There is also significant demand from Heavy Duty trucks servicing the N3 freight corridor, and public buses and buildings within the Johannesburg/Durban metropolises. In Durban, hydrogen demand could reach 70 kt by 2030 in a high uptake scenario. Demand is primarily driven by the mobility sector now, with the growth of fuel cell Heavy and Medium-duty trucks along the N3 freight corridor, as they reach cost parity with diesel trucks. Several ports present opportunities for hydrogen in port operational vehicles such as forklifts and cold ironing from fuel cells as well as

marine bunkering in the long-term. Some industrial demand, such as pulp and paper factories, and public building demand is also foreseen. Mogalakwena/Limpopo is positioned as the mining hub, with 90% of its nearly 40 kt of H₂ demand driven by possible demand from mining trucks across the region's mines. The flagship Limpopo Science and Technology initiative will also provide demand for fuel cells to power its building stock.

3 INVITATION FOR PROPOSAL

Proposals are hereby invited to develop Industrial Green Hydrogen training course materials.

The NCPC-SA is committed to capacity building and has placed great emphasis on the need to develop green skills. The intention is to address immediate scarce and critical skills through developing and offering new and relevant training courses and recognizing green skills. The successful service provider will be required to map potential hydrogen users, nationally, and to establish the need and potential for the consideration, evaluation, and introduction of hydrogen as a vehicular fuel in large transport fleets in the immediate to short term and to explore opportunities for hydrogen fuel cell applications as a plant fuel and energy storage option in the medium term.

The appointed consultant will also be required to survey existing national and international green hydrogen training courses, to benchmark and align the introductory and end user content with best available and relevant programmes and technologies and in so doing avoid costly and time-consuming duplication. Suggested peer programmes to earmark for benchmarking:

- GIZ - <https://www.giz.de/en/worldwide/312.html>
- Fraunhofer - <https://www.fraunhofer.de/en.html>
- RENAC - <https://www.renac.de/>
- SANEDI - <https://www.sanedi.org.za/>
- CSIR Energy Centre - <https://www.csir.co.za/energy-research-centre>
- UWC

The service provider is requested to develop curricula and content (presentation slides and manuals, including a trainer's manual with exercises, tests, and discussion topics) for the four proposed training courses mentioned below. A proposed learning pathway must also be included.

- Introduction to Green Hydrogen course for Executive Decisionmakers (1-day)

- Introduction to Green Hydrogen course for Community Members and General Public (1-day)
- The **End User course in Industrial Green Hydrogen Systems (2 to 3 days)**
- The **User training course in Green Hydrogen Safety and Handling (2 to 3 days)**

The two End User courses should be developed as independent modules that can be delivered as one course, or separately as stand-alone offerings. Very little or no overlap is therefore expected.

The training course guideline and structure for each is described below:

Two separate 1-Day Introductory Green Hydrogen courses with different learning objectives:

- **Duration:** 8 Hours
- **Material Required:** As defined in section 3 and section 4.
- **Target audience:**
 - 1: Executive Decisionmakers
 - 2: Community members surrounding and supporting potential Hydrogen projects.

One 2-Day End-User Green Hydrogen System Training Course:

- **Duration of Module:** 16 hours
- **Material required:** As defined in section 3 and section 4.
- **Target audience:** Senior Industrial and Commercial Plant Management, Plant Engineers and Utility Managers, Maintenance Managers, Process Engineers, Energy Consultants, Government Officials (Directors, Deputy Directors), Academia, Engineering Students.

One 2-Day End-User Green Hydrogen Safety and Handling Training Course:

- **Duration of Module:** 16 hours
- **Material required:** As defined in section 3 and section 4.
- **Target audience:** Senior Industrial and Commercial Plant Management, Plant Engineers and Utility Managers, Maintenance Managers, Process Engineers, Artisans, Engineering Students and TVET students.

Please note that Theme 2 through 7 refers to the content of the **2-Day End User Green Hydrogen System Training** and Theme 8 through 10 refers to the **2-Day End User Green Hydrogen Safety and Handling Training**. Theme 1 refers to the 1-Day Introductory courses. Core themes are listed below but can be expanded upon by service providers.

- 1-Day Introductory Green Hydrogen course

Proposed Learning Outcomes

- A basic knowledge of green Hydrogen
- Hydrogen application and related/derivative molecules in the world economy and in South Africa and decarbonisation
- Industry development considerations
- How Hydrogen can be produced
- How Hydrogen can be stored
- Hydrogen Safety
- Environmental aspects

Theme 1a: Community Awareness Raising

- Basic description of climate change
- Action to mitigate further impacts
- How and where Green Hydrogen can be used to decarbonise
- Green Hydrogen and related molecules production methods
- Green Hydrogen and related molecule storage and transport
- Hydrogen and related molecules Safety and Environmental Impact

Theme 1b: Executive Decision Makers

- Climate change, Sustainable Development Goals accords and agreements
- Hard to abate sectors, and where Green Hydrogen can be used to decarbonise
- Green Hydrogen and related molecules production methods
- Green Hydrogen and related molecule storage and transport
- Hydrogen and related molecules Safety and Environmental Impact
- Technology costs and benefits
- Overview of plans for Hydrogen projects in the country

- 2-Day End User Green Hydrogen System Training

Proposed Learning Outcomes

- A Fundamental Knowledge of Green Hydrogen
- Knowledge of the History of Hydrogen
- Understand How Hydrogen can be Produced and Stored
- Hydrogen Applications
- Awareness of the Potential of Hydrogen in a Decarbonised World
- Industry Development Considerations
- Hydrogen Safety

Theme 2: Foundation

- Carbon Emissions by Sector
- Current and Future Energy Demand
- Global Acceptance of Climate Change – Potential Impacts of a 2°C temperature increase in average global temperature
- Action to mitigate further impacts
- Global Net Zero commitments
- Policy and Regulatory Landscape

Theme 3: Introduction to Hydrogen

- History and future of Hydrogen from 1500 to 2050
- Knowledge Check – What Drove Hydrogen in the 70s
- Rising Oil Prices

- Green Hydrogen
- Liquid and Compressed Hydrogen
- Technology Improvements
- Low-Cost Renewables

Theme 4: Hydrogen Production and Storage

- Decarbonisation Solutions (Energy Efficiency, Electrification via Renewable Energy, Renewable Gases, Carbon Capture & Storage, Nature Based Solutions, Other Based Technologies)
- The Need for Clean Fuels
- Hydrogen Production Methods
- Hydrogen Storage
- Hydrogen Storage Materials
- Opportunities

Theme 5: Hydrogen Applications and Safety Aspects

- What are Fuel Cells
- How Fuel Cells Work
- Fuel Cell Components (Membrane Electrode Assembly, Polymer Electrolyte Membrane, Catalyst Layers, Gas Diffusion Layer, Hardware, Bi-polar Plates and Gaskets)
- Fuel Cell Auxiliaries (Fuel Cell Stack, Fuel Processor, Power Conditioners)
- Types of Fuel Cells, why hydrogen, applications, advantages and disadvantages, (Polymer Electrolyte Membrane, Direct Methanol, Alkaline, Phosphoric Acid, Molten Carbonate, Solid Oxide, Reversible Fuel Cells)
- Hybrid Energy Systems
- Hydrogen Safety

Theme 6: Fuel Cell Vehicles (FCV)

- Components of a Hydrogen Fuel Cell Vehicle (Power Control Unit, Motor, Boost Converter, Fuel Cell Stack, Hydrogen Tank, Battery)
- Fuel Cell Stack - other applications, advantages and disadvantages
- Hydrogen Refuelling
- Modes of Operation
- Regenerative Braking
- Emissions
- Pros & Cons of FCVs
- Safety Aspects of Hydrogen Fuel Cell
- Challenges for FCVs
- Recent Development of Hydrogen FCVs (Toyota Mirai, Hyundai Nexo, Honda Clarity, Audi A7 h-tron, Mercedes Benz GLC F-Cell...)
- FCVs vs Battery Electric Vehicles vs Internal Combustion Engines

Theme 7: Assignment

- Development of a Business Model for the use of Hydrogen as a vehicular fuel in a heavy transport fleet

Conclusion

- Future Application of Hydrogen
- Enabling Policy

- 2-Day End User Green Hydrogen Safety and handling Training Course

Proposed Learning Outcomes

- A Fundamental Knowledge of hydrogen properties
- Knowledge of the Hydrogen safety aspects
- Understand How Hydrogen leaks and ignition can be handled
- Awareness of the related safety codes and standards associated with hydrogen value chain
- Awareness of Regulatory, certification and permitting procedures for green hydrogen.

Theme 8: Fundamentals of Hydrogen safety and risks

- **Basics on Hydrogen safety**
 - i. Hydrogen properties related to safety and its comparison with other fuels.
 - ii. Importance of hydrogen safety.
 - iii. Hazard and risk scenarios.
 - iv. Hydrogen hazard risk mitigations – dispersions, natural and forced ventilations, and leak detection (sensing).
- **Hydrogen ignition and identification of ignition sources**
 - i. Ignition sources - spontaneous ignition of sudden releases and triggered ignitions.
 - ii. Hydrogen ignition mechanisms and detonation limits.
 - iii. Prevention of ignition.
- **Harm criteria for people and property**
 - i. Non-thermal health hazards of hydrogen.
 - ii. Thermal of fires on humans, structures, and environments.
 - iii. Pressure impacts from blasts/explosions.
- **Hydrogen material compatibility**
 - i. Metals interactions: fundamental aspects
 - ii. Non-metallic, polymeric materials and gases interaction of hydrogen
 - iii. Hydrogen embrittlement and mitigation measures
- **Examples and lesson from incidences and accidents involving hydrogen**
 - i. Minor incidences related to operational handling of hydrogen systems
 - ii. Major or catastrophic incidences
 - iii. Lessons learnt

- **Outdoor and indoor Hydrogen leaks and mitigation**
 - i. High pressure hydrogen leaks.
 - ii. Cryogenic leaks.
 - iii. Mitigation measures for hydrogen leaks or releases.

Theme 9: Hydrogen Safety codes and standards related to the hydrogen value chain

- i. Hydrogen fuel quality
- ii. Hydrogen embrittlement tests
- iii. Hydrogen safety
- iv. Hydrogen production
- v. Hydrogen storage
- vi. Hydrogen transportation/distribution storage devices
- vii. Fuelling and dispensing
- viii. Hydrogen stationary fuel cells
- ix. Hydrogen vehicles safety and performance

Theme 10: Hydrogen Regulatory and certification consideration in the South African Context

- i. The status quo for Regulations, certification and permitting procedures in South Africa
- ii. The status quo for Regulations and certifications in other countries
- iii. Lessons and Recommendations

4 PROPOSAL SPECIFICATION

4.1 Introductory course material development activities

- Two Introductory course curriculum documents (using the NCPC-SA template) outlining the target audience, objectives and outcomes of the training, the objectives and key lessons of each course topic/ section / chapter and the associated delivery time periods. See Annexure B.
- Two 1-Day classroom training Power Point slide pack comprising 100 – 120 numbered slides. The template for each course will be provided. The content structure as supplied by the NCPC-SA must be used and supplied together with accompanying facilitator and guidance notes on all content slides.

- 2 Half-day virtual training sessions (for each End User course) with MS PowerPoint slide packs, comprising in total 100-120 numbered slides on the NCPC-SA power point slide template applying the content structure with accompanying facilitator and guidance notes on all content slides.
- Two training feedback forms to evaluate each course's logistics, content and facilitator performance with multiple and open-ended questions that can be completed within 10-minute period, maximum.

4.2 End User training material development activities

Key elements to be developed by the service provider comprise the following material:

- An End User course curriculum document for each course (using the NCPC-SA template) outlining the target audience, objectives and outcomes of the training, the objectives and key lessons of each course topic/ section / chapter and the associated delivery time periods. See Annexure B.
- A 2-Day classroom training Power Point slide pack (for each course) comprising 220 – 250 numbered slides. The template for each course will be provided. The content structure as supplied by the NCPC-SA must be used and supplied together with accompanying facilitator and guidance notes on all content slides. The content must include a 15-minute power review at the start of day 2 of each course and include four 15-minute quizzes, one on each training day
- 4 Half-day virtual training sessions (for each course) with Power Point slide packs, comprising in total 220 – 250 numbered slides on the NCPC-SA power point slide template applying the content structure with accompanying facilitator and guidance notes on all content slides. The content must include a 15-minute power review at the start of mornings 2,3, 4 and 5 and a 20-minute quiz after every day of instruction. After each chapter or unit a few (in the order of 3) discussion questions need to be listed which the facilitator can use to review the chapter and gauge the understanding of the content.
- A 100 to 150-page End User training manual (for each course) in MS Word with a broader content subject range than that of the slide pack containing relevant benchmarking, case study and related best practice metrics which enables its use as a reference source.

- Two practical assignments for each course requiring access to a candidate plant's data and information and related research to test the candidate's understanding of the course material. The assignment content should allow completion within 5 days.
- Three 1-hour class tests for each course (therefore 6 test papers) with accompanying memorandums, answers sheets and an excel scoring worksheet for each test.
- Class handouts relevant to each course comprising Hydrogen case studies, best practises, calculators, relevant publications, research articles, position papers, concept documents, conversion tables and general studies.
- A training feedback form to evaluate each course's logistics, content and facilitator performance with multiple and open-ended questions that can be completed within 10-minute period, maximum.
- Development of Train the Trainer (TtT) material for Introductory as well as End User course (the duration of which could span from 2-4 days) that will be delivered to prospective facilitators that will be identified by the lead facilitator. These prospective facilitators will be tested on their subject matter knowledge, delivery/presentation skills. After successful completion of the Train the Trainer, prospective facilitators will be qualified to deliver the i-Day Introductory courses as well as the End User courses.
- Scoring sheet to be used in assessing the prospective facilitators should be included with each activity that will be assessed together with the "weight" of each activity.

4.3 Expert training material development activities

- The appointed service provider will be expected to identify (in consultation with the NCPC-SA and HySA) relevant areas within the Green Hydrogen field in which "Expert level" training courses can be developed with reference to the Hydrogen Society Roadmap and other relevant documents. Also taking into consideration the learning technologies and facilities available within the CSIR which includes (but is not limited to) the CSIR Learning Factory.
- The service provider will develop a report in which these potential "Expert courses" are identified, discussed and a framework developed for the content of such courses. It is expected that at least two such courses be included.

4.4 First rounds of delivery of the courses

- Delivery of four Introductory courses must be included in the proposal/quote. These courses may be delivered online or in classroom (in which case the NCPC-SA will book and pay travel and accommodation costs of the lead facilitator(s)). The online or classroom delivery will depend on the COVID regulations and logistical arrangements by the NCPC-SA.
- Delivery (facilitation) of three sets of End User courses must be included in the proposal/quote. Therefore 6 End User courses in total. These courses may be delivered online or in classroom (in which case the NCPC-SA will book and pay travel and accommodation costs of the lead facilitator(s)). The online or classroom delivery will depend on the COVID regulations and logistical arrangements by the NCPC-SA.
- Marking and Assessing of the assignments and tests of all three sets of courses and providing the scoring sheet to the NCPC-SA.
- Delivery of two TtT events.

4.5 Course content framework and guideline

The training course guideline structure is presented below:

4.6 Summary of deliverables

	Deliverable
1	Two End User and two Introductory course curricula
2	Two End User and two Introductory course classroom slide packs
3	Two End User and two Introductory course Online slide packs
4	Two sets of End User 15 min quizzes
5	Two End User training manual in MS Word with exercises and case studies.
6	Two sets of two End User practical assignments (two for each course)
7	Three 1-hour End User class tests for each course (6 in total).
8	Pack of class handouts for each course separately.
9	Training feedback form for each course (therefore 4 forms).
10	Two sets of Train the Trainer Material.
11	Development of potential “Expert level” training courses report.

12	Facilitation of 4 Introductory training courses.
13	Facilitation of six End User courses with marking and scoring of assignments as well as marking and scoring of the tests as well as re-write tests.
14	Delivery of two Train the Trainer events to prospective Trainers.

5 FUNCTIONAL EVALUATION CRITERIA

The evaluation of the functional / technical detail of the proposal will be based on the following criteria:

Criteria	Criteria Description	Weight
Qualification and experience of team members	Provide a list of team members and their qualifications.	60
Timeframe	Projected timeframe to complete all tasks described	30
Additional elements that add value	Proposal includes additional elements that adds value to the potential impact of the proposed projects	10
	Total	100

- Proposals with functionality / technical points of less than the pre-determined minimum overall percentage of 70% and less than 50% on any of the individual criteria will be eliminated from further evaluation.
- Refer to Annexure A for the scoring sheet that will be used to evaluate functionality.

6 ELIMINATION CRITERIA

Proposals will be eliminated under the following conditions:

- Submission after the deadline;
- Proposals submitted at incorrect location or email address;

- Bidders that are listed on the NT database of restricted suppliers will not be considered.
- Bidders that are registered on the NT Register of Tender Defaulters will not be considered.
- Bidders that do not submit a fully completed and signed SBD 1 and SBD 4 Form will not be considered.

7 NATIONAL TREASURY CENTRAL SUPPLIER DATABASE REGISTRATION

Before any negotiations will start with the winning bidder it will be required from the winning bidder to:

- be registered on National Treasury's Central Supplier Database (CSD). Registrations can be completed online at: www.csd.gov.za;
- provide the CSIR of their CSD registration number; and
- provide a valid copy of B-BBEE certificate issued by an accredited verification agency and bearing a SANAS logo; or
 - Valid sworn affidavits made on DTIC designed templates; or
 - DTIC issued affidavit; or
 - CIPC issued B-BBEE certificate. If no certificate can be provided, no points will be scored during the evaluation process. (RSA suppliers only)

SECTION B – TERMS AND CONDITIONS

1 PROCEDURE FOR SUBMISSION OF PROPOSALS

- 1.1 All proposals must be submitted electronically to tender@csir.co.za.
- 1.2 Respondents must use the RFP number as the subject reference number when submitting their bids.
- 1.3 The e-mail and file sizes should not exceed a total of 25MB per e-mail.
- 1.4 The naming/labeling syntax of files or documents must be short and simple (e.g., Product Catalogues).
- 1.5 All documents submitted electronically via e-mail must be clear and visible.
- 1.6 All proposals, documents, and late submissions after the due date will not be evaluated.
- 1.7 Documents submitted via cloud (i.e dropbox, WeTransfer, Google Drive) will not be considered.

NB: NO HARD COPIES OR PHYSICAL SUBMISSIONS WILL BE ACCEPTED

2 TENDER PROGRAMME

The tender program, as currently envisaged, incorporates the following key dates:

- | | |
|---|------------------|
| • Issue of tender documents: | 15 December 2022 |
| • Last date for submission of queries: | 24 January 2023 |
| • Closing / submission Date: | 30 January 2023 |
| • Estimated contract duration (in months/years) | 10 months |

3 SUBMISSION OF PROPOSALS

- 3.1 All proposals are to be submitted electronically to tender@csir.co.za. No late proposals will be accepted.
- 3.2 Responses submitted by companies must be signed by a person or persons duly authorised.
- 3.3 All e-mailed proposal submissions are to be clearly subject referenced with the RFP number. Proposals must consist of two parts, each of which must be sent in two separate e-mails with the following subject:

PART 1: Technical Proposal RFP No.: 1065/30/01/2023

PART 2: Pricing Proposal RFP No.: 1065/30/01/2023

- 3.4** The CSIR will award the contract to qualified tenderer(s)' whose proposal is determined to be the most advantageous to the CSIR, taking into consideration the technical (functional) solution, price, and B-BBEE.
- 3.5** Proposals submitted must be in the following file formats:
- PDF.

4 DEADLINE FOR SUBMISSION

Proposals shall be submitted at the e-mail address mentioned above no later than the closing date of **Monday, 30 January 2023**, during CSIR's business hours. The CSIR business hours are between 08h00 and 16h30.

Where a proposal is not received by the CSIR by the due date and stipulated e-mail address, it will be regarded as a late submission. Late submissions will not be considered.

5 AWARDING OF TENDERS

- 5.1** Awarding of tenders will be published on the National Treasury e-tender portal or the CSIR's tender website. No regret letters will be sent out.

6 EVALUATION PROCESS

6.1 Evaluation of proposals

An evaluation team will evaluate all proposals for functionality, price, and B-BBEE. Based on the results of the evaluation process and upon successful negotiations, the CSIR will approve the awarding of the contract to successful tenderer/s.

A two-phase evaluation process will be followed:

- 6.1.1 The first phase includes the evaluation of elimination and functionality criteria.
- 6.1.2 The second phase includes the evaluation of price and B-BBEE status.

Pricing Proposals will only be considered after the functionality phase has been adjudicated and accepted. Only proposals that achieved the specified minimum qualification scores for functionality will be evaluated further using the preference points system.

6.2 Preference points system

The 80/20 preference point system will be used where 80 points will be dedicated to pricing and 20 points to B-BBEE status. If all tenders received are more than R50m, the proposal will be cancelled and re-issued.

7 REQUIREMENTS FOR A VALID BROAD-BASED BLACK ECONOMIC EMPOWERMENT (B-BBEE) CERTIFICATE, CIPC CERTIFICATE AND SWORN AFFIDAVIT

7.1 Only those tenderers who submit a valid SANAS accredited B-BBEE certificate or Sworn Affidavit (dtic or CIPC) will be awarded points for B-BBEE during evaluation.

7.2 The following constitutes a valid **B-BBEE certificate**:

- Name of enterprise as per enterprise registration documents issued by CIPC, and enterprise business address;
- Value-Add Tax number, where applicable;
- The B-BBEE Scorecard against which the certificate is issued, indicating all elements and scores achieved for each element. The actual score achieved must be linked to the total points as per the relevant Codes;
- B-BBEE status with corresponding procurement recognition level.
- The relevant Codes used to issue the B-BBEE Verification Certificate.
- Date of issue and expiry (e.g. 9 June 2018 to 8 June 2019). Where a measured entity was subjected to a re-verification process, due to material change, the B-BBEE Verification Certificate must reflect the initial date of issue, date of re-issue and the initial date of expiry. Re-verification does not extend the lifespan of the B-BBEE Verification Certificate
- Financial period which was used to issue the B-BBEE Verification Certificate.
- Unique identification number of the B-BBEE verification professional or agency (e.g., BVA...).
- Name and logo/mark of the B-BBEE verification professional or agency.
- A B-BBEE Verification Certificate must be signed by the technical signatory at the bottom with full name and surname. The details of the technical signatory can be checked from the SANAS website (www.sanas.co.za). No other person is allowed to sign the B-BBEE Verification Certificate apart from the technical signatory.
- The SANAS logo on the B-BBEE Verification Certificate.

7.3 The following constitutes a valid **dtic Sworn Affidavit:**

- Name/s of deponent as they appear in the identity document and the identity number.
- Designation of the deponent as either the director, owner or member must be indicated in order to know that person is duly authorised to depose of an affidavit.
- Name of enterprise as per enterprise registration documents issued by the CIPC, where applicable, and enterprise business address.
- Percentage of black ownership, black female ownership and designated group. In the case of specialised enterprises as per Statement 004, the percentage of black beneficiaries must be reflected.
- Indicate total revenue for the year under review and whether it is based on audited financial statements or management account.
- Financial year end as per the enterprise's registration documents, which was used to determine the total revenue.
- B-BBEE Status level. An enterprise can only have one status level.
- Empowering supplier status must be indicated. For QSEs, the deponent must select the basis for the empowering supplier status.
- Date deponent signed and date of Commissioner of Oath must be the same.
- Commissioner of Oath cannot be an employee or ex officio of the enterprise because, a person cannot by law, commission a sworn affidavit in which they have an interest.

7.4 The following constitutes a valid **CIPC B-BBEE certificate:**

- Name of enterprise, registration number and business address.
- Date of issue and expiry adding to twelve months (e.g., 9 June 2018 to 8 June 2019) must be indicated.
- Percentage of total black ownership, black female ownership and total white ownership.
- Certificate number.
- Barcode with tracking number
- Barcode with enterprise number.
- B-BBEE Status and procurement recognition level.
- The dtic logo on the top left corner, and CIPC logo on the top right corner.
- CIPC watermark

8 PRICING PROPOSAL

- 8.1 Pricing proposal must be cross-referenced to the sections in the Technical Proposal. Any options offered must be clearly labelled. Separate pricing must be provided for each option offered to ensure that pricing comparisons are clear and unambiguous.
- 8.2 Price needs to be provided in South African Rand (excl. VAT).
- 8.3 Only firm prices* will be accepted during the tender validity period. Non-firm prices** (including prices subject to rates of exchange variations) will not be considered.
- 8.4 Payment will be according to the CSIR Payment Terms and Conditions.

9 VALIDITY PERIOD OF PROPOSAL

Each **proposal** shall be valid for a minimum period of hundred and twenty (120) calendar days calculated from the closing date.

10 APPOINTMENT OF SERVICE PROVIDER

- 10.1 The contract will be awarded to the tenderer who scores the highest total number of points during the evaluation process, except where the law permits otherwise.
- 10.2 Appointment as a successful service provider shall be subject to the parties agreeing to mutually acceptable contractual terms and conditions. In the event of the parties failing to reach such agreement, CSIR reserves the right to appoint an alternative supplier.
- 10.3 Awarding of contracts will be announced on the National Treasury website, and no regret letters will be sent to unsuccessful bidders.

11 ENQUIRIES AND CONTACT WITH THE CSIR

Any enquiry regarding this RFP shall be submitted in writing to CSIR at tender@csir.co.za with **RFP No:1065/30/01/2023 – “The provision of services in development of Industrial Green Hydrogen Systems and Green Hydrogen Safety and Handling Training Course Materials on behalf of the CSIR”** subject.

Any other contact with CSIR personnel involved in this tender is not permitted during the RFP process other than as required through existing service arrangements or as requested by the CSIR as part of the RFP process.

12 MEDIUM OF COMMUNICATION

All documentation submitted in response to this RFP must be in English.

13 COST OF PROPOSAL

Tenderers are expected to fully acquaint themselves with the conditions, requirements, and specifications of this RFP before submitting proposals. Each bidder assumes all risks for resource commitment and expenses, direct or indirect, of proposal preparation and participation throughout the RFP process. The CSIR is not responsible directly or indirectly for any costs incurred by tenderers.

14 CORRECTNESS OF RESPONSES

- 14.1** The tenderer must confirm satisfaction regarding the correctness and validity of their proposal and that all prices and rates quoted cover all the work/items specified in the RFP. The prices and rates quoted must cover all obligations under any resulting contract.
- 14.2** The tenderer accepts that any mistakes regarding prices and calculations will be at their own risk.

15 ENGAGEMENT OF CONSULTANTS

The consultants will only be remunerated at the rates:

- Determined in the "Guideline for fees", issued by the South African Institute of Chartered Accountants (SAICA); or
- Set out in the "Guide on Hourly Fee Rates for Consultants", by the Department of Public Service and Administration (DPSA); or
- Prescribed by the body - regulating the profession of the consultant.

16 TRAVEL EXPENSES

All travel expenses for the CSIR's account, be it directly via the CSIR's travel agent or indirectly via re-imbursements, must be in line with the CSIR's travel policy. The following will apply:

- i. Only economy class tickets will be used.
- ii. A maximum of R1400 per night for accommodation, dinner, breakfast and parking will be allowed.
- iii. No car rentals of more than a Group B will be accommodated.

17 VERIFICATION OF DOCUMENTS

17.1 Tenderers should check the numbers of the pages to satisfy themselves that none are missing or duplicated. The CSIR will accept no liability concerning anything arising from the fact that pages are missing or duplicated.

17.2 Only one electronic copy of the proposal (Technical and Financial) must be submitted via e-mail to tender@csir.co.za. If the bidder sends more than one proposal, the first submission shall take precedence should it not have been recalled/withdrawn in writing by the bidder.

17.3 Pricing schedule and B-BBEE credentials should be submitted with the proposal, but as a separate e-mail and no such information should be available in the technical proposal.

18 SUB-CONTRACTING

18.1 A tenderer will not be awarded points for B-BBEE status level if it is indicated in the tender documents that such a tenderer intends sub-contracting more than **25%** of the value of the contract to any other enterprise that does not qualify for at least the points that such a tenderer qualifies for, unless the intended sub-contractor is an exempted micro enterprise that has the capability and ability to execute the sub-contract.

18.2 A tenderer awarded a contract may not sub-contract more than **25%** of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an exempted micro enterprise that has the capability and ability to execute the sub-contract.

19 ADDITIONAL TERMS AND CONDITIONS

- 19.1** A tenderer shall not assume that information and/or documents supplied to CSIR, at any time prior to this request, are still available to CSIR, and shall consequently not make any reference to such information document in its response to this request.
- 19.2** Copies of any affiliations, memberships and/or accreditations that support your submission must be included in the tender.
- 19.3** In case of proposal from a joint venture, the following must be submitted together with the proposal:
- Joint venture Agreement including split of work signed by both parties.
 - The original or certified copy of the B-BBEE certificate of the joint venture.
- 19.4** An omission to disclose material information, a factual inaccuracy, and/or a misrepresentation of fact may result in the disqualification of a tender, or cancellation of any subsequent contract.
- 19.5** Failure to comply with any of the terms and conditions as set out in this document will invalidate the proposal.

20 PERSONAL INFORMATION

- 20.1** Each Party consents to the other Party holding and processing “personal information” (as defined in the POPI Act) relating to it for legal, personnel, administrative and management purposes (including, if applicable, any “special personal information” relating to him/her, as defined in the POPI Act). Notwithstanding the generality of the aforesaid, each Party hereby undertakes to comply with all relevant provisions of the POPI Act and any other applicable data protection laws. The Client further agrees to comply with all CSIR’s reasonable internal governance requirements pertaining to data protection.
- 20.2** Each Party consents to the other Party making such information available to those who provide products or services to such parties (such as advisers, regulatory authorities, governmental or quasi-governmental organisations and potential purchasers of such Party or any part of their business).
- 20.3** The Client consents to the transfer of such information to CSIR’s business contacts outside South Africa in order to further its business interests.
- 20.4** While performing any activity where a Party is handling personal information as a “responsible party” (as defined in the POPI Act), each Party undertakes that it will process the personal information strictly in accordance with the terms of the POPI Act, this Contract,

and the other Party's instructions from time to time, and take appropriate operational measures to safeguard the data against any unauthorised access.

- 20.5** Each Party acknowledges that in the course of conducting business with each other, each Party intends to maintain and process personal information about the other Party in an internal database. By signing this Contract, each Party consents to the maintenance and processing of such personal information.
- 20.6** Where relevant, the Client shall procure that all of its personnel, agents, representatives, contractors, sub-contractors, and mandataries shall comply with the provisions of this clause 12 (Personal Information). The CSIR shall be entitled on reasonable notice to conduct an inspection or audit Client's compliance with the requisite POPI Act safeguards.

21 CSIR RESERVES THE RIGHT TO

- 21.1** Extend the closing date;
- 21.2** Verify any information contained in a proposal;
- 21.3** Request documentary proof regarding any tendering issue;
- 21.4** Give preference to locally manufactured goods;
- 21.5** Appoint one or more service providers, separately or jointly (whether or not they submitted a joint proposal);
- 21.6** Award this RFP as a whole or in part;
- 21.7** Cancel or withdraw this RFP as a whole or in part.

22 DISCLAIMER

This RFP is a request for proposals only and not an offer document. Answers to this RFP must not be construed as acceptance of an offer or imply the existence of a contract between the parties. By submission of its proposal, tenderers shall be deemed to have satisfied themselves with and to have accepted all Terms & Conditions of this RFP. The CSIR makes no representation, warranty, assurance, guarantee or endorsements to tenderer concerning the RFP, whether with regard to its accuracy, completeness or otherwise and the CSIR shall have no liability towards the tenderer or any other party in connection therewith.

DECLARATION BY TENDERER

Only tenderers who completed the declaration below will be considered for evaluation.

RFP No: 1065/30/01/2023

I hereby undertake to render services described in the attached tendering documents to CSIR in accordance with the requirements and task directives / proposal specifications stipulated in **RFP No. 1065/30/01/2023** at the price/s quoted. My offer/s remains binding upon me and open for acceptance by the CSIR during the validity period indicated and calculated from the closing date of the proposal.

I confirm that I am satisfied with regards to the correctness and validity of my proposal; that the price(s) and rate(s) quoted cover all the services specified in the proposal documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.

I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this proposal as the principal liable for the due fulfilment of this proposal.

I declare that I have no participation in any collusive practices with any tenderer or any other person regarding this or any other proposal.

I accept that the CSIR may take appropriate actions, deemed necessary, should there be a conflict of interest or if this declaration proves to be false.

I confirm that I am duly authorised to sign this proposal.

NAME (PRINT)

CAPACITY

SIGNATURE

NAME OF FIRM

DATE

WITNESSES	
1
2

24 ANNEXURE A – Technical scorecard

Criteria	Criteria Description	Weight	3	5	7	10
Qualification and experience of team members	Provide a list of team members with Engineering or equivalent qualifications. Scoring will be based on highest qualified individuals.	45	The bidder must provide evidence of having at least one Honour's degree in Engineering or equivalent qualification	The bidder must provide evidence of having at least one Master's degree in Engineering or equivalent qualifications	The bidder must provide evidence of having at least one Ph.D. degree in Engineering or equivalent qualifications	The bidder must provide evidence of having at least two Ph.D.s in Engineering or equivalent qualifications
	Hydrogen related experience. Only the experience of the highest qualified individual will be used for scoring.	15	Hydrogen related experience per individual of 0 to 5 years.	Hydrogen related experience per individual of 5 to 10 years.	Hydrogen related experience per individual of 10 to 15 years.	Hydrogen related experience per individual exceeding 15 years.
Timeframe	Projected timeframe to complete all tasks described in proposal for the RFP	30	The projected timeframe to complete all tasks described in the proposal is more than 12 months.	The projected timeframe to complete all tasks described in the proposal is more than 6 months	The projected timeframe to complete all tasks described in the proposal is no more than 5 months	The projected timeframe to complete all tasks described in the proposal is 4 months or less
Additional elements that add value	Proposal includes additional elements that adds value to the potential impact of the proposed training programme	10	Proposal does not include additional elements that adds value to the potential impact of the proposed training programme	Proposal includes 2-4 additional elements that adds value.	Proposal includes 5-8 additional elements that adds value.	Proposal includes more than 9 additional elements that adds value.
	Total	100				

25 ANNEXURE B – Curriculum Example

Training Pump System Optimization (PSO) 1-Day Introductory Workshop

	Training	Expert / Trainer	Location	Comments
Day 1	Introductory		Training room	

Target Group:

Any technically inclined person with some involvement or potential involvement with Pump Systems, who wants to get a basic understanding of Pump System Optimisation and its benefits in terms of energy and cost savings.

Those who would like a basic introduction before carrying on to the 2 – Day End User and Expert Training levels.

Learning Objectives

- Gain an understanding of how LCC (Life Cycle Cost) affects the operational costs of a Pump System
- Gain an understanding of how to correctly estimate the actual operating costs of a Pump System
- Gain an understanding of the need of using a Systems Approach to accurately evaluate Pump Systems and optimization opportunities
- Learn about different Pump & Valve types and their uses in specific situations
- Learn about the various components within a Pump system
- Learn how to determine how a Pump system operates
- Gain an understanding of basic hydraulics and how this affects Pump system performance

- Learn about the various terminologies for Pressure, Flow, Power and Efficiency
- Gain an understanding of Pump curves and Pump performance characteristics
- Gain an understanding of System curves and the effect of control components on system performance
- Learn about various control methods and the advantages and disadvantages
- Identify the measurements required to manage Pump systems
- Identify areas for efficiency improvements
- Calculate the energy costs associated with Pump systems operation

Title: Introductory PSO Workshop

Start Time: 08:30	Section 1: Fundamentals Life Cycle Costs, Systems approach, Basic Hydraulics		120 minutes	Slide allocation	
Content	Means of Evaluation	Learning Activities	Duration	Slide #s	
Introduction to the UNIDO Industrial Energy Efficiency Project	Not applicable	Information only	20 minutes	NCPC	Tanya
Introduction of attendees and Outline of course	Not applicable	Understand participant backgrounds	20 minutes	1-5	Tanya

Pump System Life Cycle Costs	Participants questions Group discussion Class review and discussion	Understanding of Pump Systems and Life Cycle Costs	20 minutes	6 - 12	Tanya
The Systems Approach	Participants questions	Understanding the system and its components	20 minutes	13 - 19	Tanya
Pump System Fluid Relationships and Basic Hydraulics	Participants questions	Understanding Static Head, Velocity Head and Friction Losses Understanding friction factor	30 minutes	20-29	Tanya