# Scope of Work for Engagement of Consultant for Developing CO2 Emission Monitoring Dashboard for SAIL

# Objective:

SAIL seeks to engage consultant to design a dashboard for monitoring and measuring CO2 emissions from its five Integrated Steel Plants, special steel plants (viz. Salem Steel Plant (SSP) & Alloys Steel Plant (ASP)) and Chandrapur Ferro Alloy Plant (CFP), using digital tools. The agency will design and implement customized software that captures data from ERP systems (like SAP), any legacy system or manual input. It shall analyse the data to calculate unit-wise and material-wise CO2 emissions. It shall determine corporate and product-level carbon footprints and generates reports. The reports may also be used for any third-party assurance. Additionally, the agency will develop the requisite hardware infrastructure for data capture, transmission, and processing and also facilitate cloud-based data storage infrastructure. This dashboard shall provide at-a-glance view of relevant key performance indicators of a Cloud Integration using the intuitive and interactive widgets. The widgets in the dashboard shall display data in a simple metric that will help in visualizing the context information with slicing and dicing capabilities. The dashboard shall be responsive in design and shall be designed to be viewed in mobile devices also.

# Boundary of the Work:

The organization boundary for this engagement would cover all the integrated steel plants, special steels plants (SSP & ASP) and CFP. Details of plants are available in sail website: www.sail.co.in.

# Scope of Work:

The scope of workfor **Software Development** of CO2 emission dashboard of SAIL is given below:

# The consultant shall design, develop and deploy user-friendly software that integrates with existing ERP systems/Legacy system/Plant’s computer system/existing dashboards to calculate and monitor CO2 emissions from SAIL’s plants.

# The consultant shall implement features for real-time monitoring and reporting of CO2 emissions by the software. Consultant shall ensure integration of data at the most granular frequency by configuring available respective data collection sources for monitoring and reporting of CO2 emissions. However, the refresh rate of dashboard shall be on hourly basis.

# To support data analysis and emissions calculation, the software should:

* Analyze the captured data to identify and highlight CO2 emission sources and patterns of emissions for a definite time period like hourly/daily/ monthly or annually as per requirement. The consultant shall assess the current digital maturity of plants and design the dashboard for hourly data refresh.
* Monitor plant-level and shop-level key performance indicators (KPIs) based emissions on daily, monthly and annual basis and, if possible heat wise/cast wise and shall be capable of carrying out trend analysis by implementing all tools of data visualization. KPIs shall be identified in consultation with SAIL team.

If software doesn’t have the capability to automatically ingest heat/cast wise data, software should have provision for user input (manual data entry) facility.

* Use site-specific/default emission factors as specified by SAIL representative or standards as applicable.
* Software should have provision to use default emissions factors from internationally accepted databases (in consultation with SAIL), with reference mentioned alongside. The consultant shall ensure the updated default emission factors are used.
* Calculate unit-wise and material-wise CO2 emissions from production facilities using established methodologies, viz. worldsteel association, ISO14064/ISO14067 (GHG Protocol), CCTS and CBAM, with same data source to ensure single source of truth.
* Determine plant-wise, corporate and product carbon footprints, including Scope 1, 2, and 3 emissions.
* Analyze carbon balance, energy balance and mass balance from each plant (shop-wise & overall).
* CO2 emission for each shop within an ISP or unit can be determined by this dashboard by determining equivalent production.
* Software should have the flexibility to implement WSA Chain of custody, where applicable.
* Software should have AI (Artificial Intelligence) capabilities for data capture, data validation e.g., matching primary proof collected (viz. electricity bills) with data sourced from systems e.g., SAP, Level 2. In case of discrepancies, should have alert system to flag discrepancies and manual intervention should be allowed.

# The software should have facility to generate automated and customizable reports /audit files for internal review, 3rd party assessment/assurance and specific compliance reporting. Software should be able to integrate 3rd party assessment/assurance requirements to decrease the time and effort for assurance. The software should have dedicated log-in, access and interface for 3rd party auditor for digital verification to review audit files, primary proofs, reports, storage of final certifications.

# The output of the software shall be displayed in the form of customized dashboard at specific locations as per SAIL requirement. The consultant shall design the customizable dashboard, in consultation with SAIL.

# The Consultant shall develop Data Lakes for data acquisition from respective plants.

# Software shall be deployed in cloud (like Microsoft Azure, Google GCP, Amazon AWS). The Consultant shall be responsible for making the provision of the Cloud infrastructure needed to host the data and reporting platform as required. Ownership of the Cloud infrastructure and reporting platform will be with SAIL.

# The software shall be compatible with ERP (SAP), ability to interact with SAP to collect data and shall not be harmful to plants network.

# Data security norms should at the minimum adhere to MeitY guidelines.

# In order to supplement the scope of work, specified above, the consultant should also adhere to the following specific terms of reference:

# Wherever required data shall be captured in any form and if required necessary software codes shall be developed and deployed to capture the data from systems e.g., SAP, Level2, etc.

# Wherever ERP system is not yet established, mechanism may be developed for developing an interactive dashboard for collection and integrating data with the software. Provision shall also exist for manual entry or through input data transfer through excel data format.

# Modular design for addition/deletion of shops & KPIs in case of future changes in plant configuration and shop process.

# The consultant shall assess the present CO2 emission monitoring practices at SAIL and identify the gaps and KPIs for CO2 emission monitoring vis-à-vis monitoring methodologies adopted for developing the CO2 monitoring software and dashboard.

# In consultation with SAIL for real-time monitoring and data collection the software shall be capable of integrating with IoT sensors, AI, and big data platforms etc. Any hardware deployment, if required, shall be taken up with respective plant/unit. The software/solution should be flexible and should have integration capabilities with current as well as future IT landscape of SAIL and its plants which include and is not limited to IOT sensors, AI and big data platforms etc. The Consultant will need to identity the touchpoints for real-time/periodic data input. The DataLake and the dashboard should be integrated in a way that in future even other visualization platforms could leverage the DataLake for further business needs. Also, the CO2 emissions insight dashboards should be built in such a way that the data and the end-platform could seamlessly be transferred to the SAIL team on completion of project.

# The consultant shall facilitate cloud data storage system for storage, archiving and retrieval of data/ customized reports as and when required, with Round the Clock (RTO) data backup facility.

# The consultant shall establish secure and reliable data transmission networks with links to systems from plants.

# Additional Points:

# The SOPs of the software shall be made approved and periodically reviewed and updated as and when required.

* The consultant shall validate the accuracy and reliability of the CO2 emission data and calculations generated by the dashboard and demonstrate the same to SAIL on demand. SAIL may undertake independence validation through 3rd party, in case of any discrepancy, the validation undertaken by SAIL shall prevail. (Note: Appointment of 3rd party verifiers/assessors for assurance and verification services to certify the emissions data and reports generated by the dashboard shall be done by SAIL or may be done in consultant with SAIL. Payment can be billed separately; however selection is totally SAIL’s prerogative).
* Only key persons as declared by EMD should be able to generate the report (to maintain authenticity). The software should enable role-based access control to the reports and data within it. This role-based access control should be at corporate, site and plant level.
* The software should have data validation system for 3rd party assessment/assurance and validation/verification report generation. (Note: Appointment of 3rd party verifiers/assessors shall be done by SAIL or may be done in consultant with SAIL. Payment can be billed separately; however selection is totally SAIL’s prerogative).
* The software shall be capable of data storage for at least 5 yrs or as agreed by representative of EMD.
* The consultant shall provide details training programs/workshops required for operation, maintenance and updation.
* The consultant shall pass on all technical knowhow of software after commissioning to the designated team (as specified by EMD) for proper running, updation and maintenance of the software.

# Deliverables

# Software Solution: A fully functional software solution integrated with SAIL's ERP systems.

# Dedicated Cloud Infrastructure: For data backup and retrieval as and when required with proper licensing system w.r.t. SAIL.

# Training and Certification: Training materials, workshop schedules, and certification records for manpower capability development.

# Standard Operating procedures (SOPs): As per the requirement of CCTS and other methodologies as well as operation and maintenance of the software developed.

# Operation and Maintenance for 3 years:

# Provide comprehensive operational support for the software and hardware infrastructure, ensuring smooth and efficient functioning.

# Conduct regular maintenance and updates for the software and hardware to ensure optimal performance and address any issues promptly.

# Offer 24/7 technical support for continuous operation and ensure minimal downtime. A dedicated team to be deployed for round the clock monitoring and maintenance of the system.

# Continuously monitor the performance of the software and hardware infrastructure, making necessary adjustments to improve efficiency and accuracy.

# Maintain detailed records of all maintenance activities, performance metrics, and any issues encountered, providing regular reports to SAIL.

# Develop manpower capabilities for trouble shooting along with independent operation & maintenance of the system.

# By leveraging its capabilities in emissions monitoring, data validation, project management, and technical advisory, BV aims to play a crucial role in the consortium's bid to develop and implement the CO2 Emission Monitoring Dashboard for SAIL. BV's involvement will help ensure integrity, reliability, and successful delivery of the project, contributing to SAIL's efforts in sustainable steel production and emissions reduction

# Budgetary Offer:

1. Single budgetary quote as per the SOW detailed above.
2. Budgetary quote shall include cost towards O&M for 3 years. Charges towards O&M shall be paid on annual basis after completion of the year.
3. Price break-up of annual O&M charges to be provided.

|  |  |  |
| --- | --- | --- |
| **Particulars** | **Amount in Rs. (exclusive of GST)** | **Applicable GST rate & Amount**  **(%; Rs.)** |
| Budgetary Quote for overall Job |  |  |
| Price Break-up | | |
| Operation & Maintenance (per year basis) |  |  |

# Additional Requirements:

# Additionally, the Consultant to submit following in support of the budgetary offer:

1. Work Plan: The indicative project milestones are given below. Payment milestones can be distributed across various phases/deliverables of the project.

|  |  |  |  |
| --- | --- | --- | --- |
| **SL #** | **Project Phases** | **Milestones - Activities and Deliverables** | **Tentative Timeline** |
| 1 | **Phase 0** | Kick-off meeting and signing of Contract | 0 date |
| 2 | **Phase 1** – Pilot  Implementation on ISP-A | 1. Requirement Analysis: Source System Study & Fit Gap Analysis (consultant may go for assessment of all the plants at once or one-by-one) 2. Finalization of KPIs 3. Architecture / Wireframing 4. Low Level Design 5. Environment setup and integration |  |
| 1. Development (Backend & Frontend) and Unit Testing 2. Integration & System Testing 3. User Acceptance Testing 4. Software Deployment and Rollout |  |
| 1. Hypercare and User Training 2. Go-ahead for Phase 2 |  |
| 3 | **Phase 2 –**  Implementation on ISPs-B &C | 1. Scaling the Data Lake and Integrated Solution for ISPs B & C with User 2. Training & Hypercare 3. Go-ahead for Phase 3 |  |
| 4 | **Phase 3 -**  Implementation  on ISPs-D & E | 1. Scaling the Data Lake and Integrated Solution for ISPs D & E with User 2. Training & Hypercare 3. Go-ahead for Phase 4 |  |
| 5 | **Phase 4** | 1. Scaling the Data Lake and Integrated Solution for other Units viz. special steel plants (SSP & ASP) and CFP. 2. Training & Hypercare 3. Go-ahead for Phase-5 |  |
| 6 | **Phase 5** | 1. Scaling the Data Lake and Integrated Solution for Corporate unit/services unit 2. Project closure activities | **Six months** |

**Final Roll-out of the dashboard shall be six months from date of signing of contract.**

1. Brief overview of master dashboard, its features and KPIs for display, along with levels of different dashboards (viz. plant-level, shop-level, etc.) and KPIs for display.
2. Detailed specifications of cloud infrastructure along with data transmission network requirements.
3. Timelines for key deliverables.
4. Details about training programs/workshops required for manpower deployment.
5. Team size and composition, along with profile of work to be undertaken by the team members.
6. Educational qualification and experience of team leader and team members.
7. Annual turnover for last 3 years (India Operations). The consultant should be able to submit audited financial statements, if required.
8. Completion timeline, with Gantt Chart.

# Note:

# Milestone link payment shall be spread throughout the execution of the contract.

# Detailed terms & conditions of contract shall be firmed up as per the standard procedure of SAIL.

# Appointment of 3rd party verifiers/assessors shall be done by SAIL or may be done in consultant with SAIL. Payment can be billed separately; however selection is totally SAIL’s prerogative.