# ANNEXURE A

**PROJECT OUTCOMES AND DELIVERABLES**

The overall purpose of the Resource Efficiency and Cleaner Production assessment is as follows:

* To assist with quantifying energy, and identifying other major consumers within their processes.
* To use the assessment as a tool to identify potential opportunities for the reduction and more efficient use of energy within their production pipelines.
* To verify whether the energy used is efficient and that there is an ongoing program to monitor and improve the use of this resource.
* To establish an energy consumption baseline (regression analysis with indicated baseload).
* To assist in setting energy efficiency index and targets
* To assist in identifying opportunities and provide detailed recommendations for the recovery and re-use of energy and water from processes wherever feasible.
* To collect quantitative data to determine the percentage energy consumption by specific areas or significant energy users (all energy sources to be considered).
* To review the current tariff in line with production and business requirements, and identify potential opportunities for tariff optimisation.
* To provide detailed recommendations for any other energy efficiency improvements that will result in kWh reduction and economic benefits.
* To assess biomass opportunities as an alternative energy source for the plant.
* To undertake an economic feasibility analysis of all identified energy improvement opportunities
* To present recommendations to the facility management team on selected feasible and viable options and prioritisation of implementation options.
* To provide implementation support to the company (only if agreed to by management of the company) where no cost to low cost resource saving opportunities might arise

It is anticipated that the following **DELIVERABLES** will be key to the successful completion of the assessment:

* Development of project activity plan and schedule for the assessment to be undertaken.
* Determination to support the internal RECP champions at the facility for the duration of the assessment and for any future projects.
* Presentation of an overview of the intended assessment and projected outcomes at the facility.
* Completion of the RECP Assessment at the facility.
* Preparation and presentation of the Quick Scan findings following the walk-through at the facility.
* Preparation and submission of a draft IPA Report outlining the findings of the investigation at the facility, along with the following:
* Report calculations in and excel document
* All digital and infrared pictures taken on-site during the assessment
* Visual presentation of the findings to management of the facility.
* Conducting a two (2) hour Awareness Raising Session on the day of the final feedback meeting, with key employees of the company relating to the assessment and specific topics.
* Presentation of the Final IPA Report with Implementation Plan, identifying cost and dates to management of the facility, and identifying the way forward on implementation of potential options as highlighted in the final report.
* A close-out report summarising the interventions at the facility, inclusive of the views of management and their intended way forward.
* Submission of meeting minutes for the inception and feedback meetings.
* Submission of an implementation report (only if agreed upon by management of the company) as to the assistance provided for all the no-cost to low-cost recommendations that have been implemented.

**APPROACH AND METHODOLOGY**

The project scope must comprise the following activities as a minimum requirement:

Basic company information facility along with resources and utilities are presented below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Business Activity** | **Location** | **Utilities** | **Resources** | **Focus Areas** |
| Seed Processing | Swellendam | * Boilers x 2
* Compressors x 2
* Cooling Towers x 5
* Thermic Fluid Heaters x 1
* Motors > 100
 | Electricity (8 160 MWh)Coal(5 000 tonne) | EnergyWaste Biomass Opportunities |

 **Assessment Protocol and RECP Team**

The assessment will focus on the aspects as highlighted in Section 2, and an RECP champion will be identified and nominated by management of the facility, who will remain responsible for providing contact for the project. The RECP champion of site may be required to undertake tasks and investigations as part of the survey’s investigations.

The project will be approached through the phases outlined below.

**Project Inception and Planning**

The Consultant will develop and draft an RECP assessment plan and schedule outlining the proposed activities and visits to be undertaken at the facility in a Gantt Chart, and a standard NCPC-SA Pre-Visit Questionnaire (PVQ) will be forwarded to these facilities for completion prior to any site activities taking place.

The PVQ will be made available to the successful consultant, as to gain an insight into the major resource users at the plant. The inception phases will also involve planning, coordination and review of the activities to be carried out by the project team, and the timelines will also be reviewed at this stage.

The project launch phases will include meetings and presentations at the facility, to give an outline of the intended project programmes and requirements of the assessment team.

Topics to be addressed at the inception meeting to be held with management may include but will not be limited to:

* Project outline and projected time schedules,
* The role of the RECP Champions / Teams,
* Initial findings from the Pre-Visit Questionnaires,
* Resource consumption patterns for the facility,
* Proposed RECP interventions based on the PVQ information provided, and
* Information relating to the resources at the facility

**RECP Survey**

Having concluded the inception and planning activities at the facility focus will be placed on execution of the RECP Assessment with specific emphasis on the focus areas.

Key activities to be undertaken will include:

* ***Collation and interpretation of the Pre-Site Visit Questionnaire data for the facility,*** including historical data analysis, identification of existing measurement points.
* ***Conducting the assessment at the facility,*** using the following steps:
	1. Walk-through & survey
	2. Establishment of assessment mandates
	3. Establish assessment scope
	4. Analyse individual resource consumption and costs
	5. Compare individual resource performance
	6. Profiling of individual resource use patterns
	7. Inventory of individual resource use and costs
	8. Identify resource management opportunities as required
	9. Assessment of the benefits of each opportunity
	10. Two (2) hour Awareness Raising Session for employees
	11. Report for action and implementation

The above approaches which is structured more to meet the needs company, will enable the CSIR’s NCPC-SA to gain an overview of the potential for resource savings, as well as gain a good insight into the relevant management issues of these resources.

Where no-cost and low cost opportunities might be identified and highlighted to management, support will be provided by the consultant to implement accordingly. This though will only be done should the company agree to the implementation support provided.

This will also support the CSIR’s NCPC-SA in meeting the objectives as outlined above.

**Identification of Saving Opportunities:**

The information will be compiled from the detailed assessment conducted at the facility, and this will be used to identify areas where there is potential for the reduction of the resources as per the focus areas highlighted in Section 2 above.

The information will be analysed according to the following criteria:

* Identify potential for reduction of these resources
* Identify measures to further improve management of these resources
* Quantify the order of magnitude and cost estimate for each identified option
* Quantify potential savings based on pricing structure, as well as optimising use and demand patterns
* Prioritise saving options

The findings from this phase will be incorporated as part of the final assessment report for the company, and the areas for resource savings must include:

* % reduction in electrical energy usage,
* kWh reduction in electrical energy usage,
* Rand value reduction in electrical energy usage
* % reduction in energy usage,
* Litres reduction in paraffin or LPG or HFO etc.
* Rand reduction in energy usage
* % waste reduction
* % waste recycled or reused

The summary of recommendations should be reported in the Executive Summary Table of the report, and the table below serves as an example of how to report on this.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Resource Optimisation Opportunities** | **Estimated Savings** | **Investment Cost****(Rand per Annum)** | **Payback Period****(Years)** |
| **kWh per****annum** | **Rand per annum** | **Ton Co2 per annum** |
| **Electrical Energy Savings Recommendations** |
| 1. |  |  |  |  |  |  |
| 2. |  |  |  |  |  |  |
| **Energy Savings Recommendations** |
| 1. |  |  |  |  |  |  |
| 2. |  |  |  |  |  |  |
| **Waste Reduction Recommendations** |
| 1. |  |  |  |  |  |  |
| 2. |  |  |  |  |  |  |
| **Qualitative Findings** |
| 1. |  |  |  |  |  |  |
| 2. |  |  |  |  |  |  |
| **TOTALS** |  |  |  |  |  |

**Reporting and Company Feedback**

A Quick Scan Presentation will be presented to management of the facility following the walk-through, as well as a detailed IPA report based upon the RECP survey findings, which will comprise of the specific management interventions as indicated above in the RECP Survey section. The final report will include a utility audit, highlighting of specific areas for potential savings, recommended additional utility metering requirements, as well as further recommendations regarding ongoing resource monitoring & targeting, etc.

Historical resource usage data will be expertly analysed in detail through a process of regression, and the report where applicable will include benchmarking data based upon performance indices. These will be used in comparison with known performance indices to further establish the scope for savings potential. On request from management at the facility, it is also expected that the assessment report also include renewable energy recommendations, and this will appear separate from the main table.

The final report will upon completion, be presented at a formal feedback session with management of the facility, and the intended purpose is to outline the project focus and confirming the options identified for implementation.

A plan of action for possible implementation of the options is then to be agreed upon with management of the facility.

**Awareness Raising Session**

It is expected that on the day of the final feedback meeting with management of the facility, an awareness raising session be conducted with all relevant staff members and management, and this is to transfer the benefits and highlight the findings of the RECP assessment through a two (2) hours workshop. This is to be conducted in the following manner:

* Using visual power point presentations, and
* Supported by printed documentation with relevant cases or examples to adequately explain concepts.

**Close Out Report**

A Close-Out Report detailing a summary of all the interventions (Quick Scan, IPA, Report, Feedback and Awareness training), and inclusive of all the information related to the project (spreadsheets and word documents) will be required to be submitted to the Project Manager at the end of the project.

**COMMENCEMENT AND COMPLETION DATES**

It is anticipated that the work will commence upon acceptance and signing of a contract with an appropriate RECP specialist appointed by the CSIR’s NCPC-SA, and it is expected that the assessment be completed within one (1) month of commencement of the project, depending on the extent of the project at the plant. Consideration will also be given to the measurement and monitoring needed to be undertaken at the facility.

The table below outlines the sequence of completion along with estimated commencement dates, and also the amount of days budgeted for each:

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity**  | **Assessment Estimated Commencement Date** | **Amount of On-Site Days** | **On-Site Assessment Completion Date** |
| Inception Meeting | 04 September 2017 | 0.5 | 04 September 2017 |
| Plant walk-through & Quick Scan  | 04 September 2017 | 1.5 | 05 September 2017 |
| Detailed Assessment | 06 September 2017 | 3 | 08 September 2017 |
| Implementation Support | 11 September 2017 | 3 | 13 September 2017 |

**Note:** *Implementation Support will be included in the contract, but this deliverable will only be considered for payment should the company agree for the consultant to provide this form of technical assistance.*

The Consultant will provide the CSIR’s NCPC-SA with projected schedules of the proposed activities with projected times scales and reporting deadlines to keep the CSIR’s NCPC-SA informed of progress. The CSIR’s NCPC-SA is to be informed of all meetings scheduled with the company and all the necessary arrangements should be made to ensure that the CSIR’s NCPC-SA is present during the initial Quick-Scan Assessment visits and feedback sessions.

All reports issued and presented to the company will be completed under the CSIR’s NCPC-SA brand, and the final report and feedback meetings will be concluded within 3 weeks of on-site assessment completion.

**ALLOCATE BUDGET FOR THE CONTRACTED SERVICES**

This project will be managed by the CSIR’s NCPC-SA and staffed by the appointed RECP specialist. The cost of the assessment will be subsidised through the CSIR’s NCPC-SA’s Resource Efficiency and Cleaner Production Programme, but will not include instances where it may be necessary to install specific monitoring equipment for the assessments. However, no installation will be undertaken without the consent and understanding of management of the facility and the CSIR’s NCPC-SA.

The following NCPC-SA measuring equipment is available to Service Providers:-

* Infrared thermometers
* Single phase power analyser
* Current Meter
* Voltmeter
* Lux meter
* etc

The following NCPC-SA measuring equipment is available to Service Providers that have completed the Expert Level UNIDO based systems optimisation training for the purpose of conducting specific systems optimisation assessment:-

* Fans Flowkinetics measurement kit
* Pumps Systems Optimisation measuring kit
* Compressed Air Systems Optimisation measuring kit
* Flue Gas Analyser and related equipment making up the Steam Systems Optimisation Measurement Kit
* 3 Phase Power Analyser
* etc

Once the tender is awarded to the winning bidder, the Service Provider is advised to contact the NCPC-SA Project Co-ordinator directly to inquire on the use / availability of the equipment to be loaned. All equipment queries are communicated directly to the NCPC-SA Project Co-ordinator.

The name and contact details of the NCPC-SA Project Co-ordinator will be made available to the winning bidder upon request thereof at the end of this tender process. There is no cost to the service provider for the loan of NCPC-SA equipment. An “equipment loan document” and a “test equipment hiring policy” document have to be signed & completed by the service provider ahead of receiving the equipment from the Cape Town-based NCPC-SA regional office.