



Energy Audit for

TAQA

Dammam, KSA



Prepared by

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1. Introduction

TAQA, based in Dammam, Saudi Arabia, has approached the Center of Excellence in Energy Efficiency (CEEE) at the Research Institute (RI) of King Fahd University of Petroleum & Minerals, Dhahran, to conduct an energy audit. The goal is to explore potential power savings, reduce carbon emissions, and improve the efficiency of their facility located in the 2nd industrial city, Dammam. On May 16, 2024, a team from CEEE visited the TAQA facility for a walkthrough and preliminary discussion regarding the project requirements.

2. What TAQA is looking for?

- Reduce emissions
- Reduce energy consumption
- Assess rooftop solar PV opportunity
- Awareness in energy efficiency

3. Objective

The primary objective of this energy audit is to identify opportunities for power savings, carbon emission reduction, and improved efficiency at the TAQA facility in Dammam 2nd Industrial City. Additionally, the CEEE will provide training and awareness to TAQA employees, along with recommendations and standardized methods to enhance performance.

4. General Objective

- **Energy Audit**
 1. Study the present energy consumption pattern
 - Analyze energy sources and bills from the past year.
 - Calculate the Energy Use Intensity (EUI) and compare it with industry benchmarks.
 2. Conduct energy auditing of the office building and workshop area
 - Perform a detailed audit by monitoring energy consumption:
 - AC and ventilation
 - Lighting
 - Equipment,

This would need assessment of the AC equipment, building envelope... etc.
 - Install some of the data loggers for a period of one to two weeks.
 3. Minimizing the cooling losses in the vehicle overhauling area

- Investigate the opportunities to minimize the cooling losses in the area where vehicles returning from the oil rigs are overhauled.
4. Investigate the rooftop solar PV installation opportunity
 - Conduct a technical analysis to design the solar rooftop PV at the facility.

5. Scope of the Work

The proposed study is expected to be carried out by conducting the following major tasks:

Task 1: Site visit and walkthrough

A site visit to the selected facility is proposed at the start of the project. There will be a meeting with the CEEE team and TAQA team at the beginning to discuss key issues such as safety and to get permission to access some equipment for observation, measurement, and monitoring. A walkthrough will then follow where observation and a few measurements will be conducted. Several energy audit equipment will also be installed on some machines to assess the operation and processes involved. A short meeting will then be held to conclude the visit and plan for the main energy audit. Information and data needed from the client for a successful energy audit will be discussed. All necessary considerations will be discussed and agreed upon with the client.

Task 2: Main energy audit

Based on the finding of task 1, the CEEE energy audit team will plan and conduct the main energy audit on a suitable date for both parties. Measurements of all equipment and processes will be conducted and certain energy audit equipment will be installed on some machines for monitoring. Arrangements will be made should there be a need for further measurements to be conducted.

Task 3: Analysis of data

The CEEE energy audit team will conduct the analysis of data obtained from the TAQA facility from both the information received and through measurement and monitoring conducted.

Task 4: Report writing containing the findings of the energy audit and recommendations

Energy audit report containing the findings of the report will be submitted to TAQA. The report will contain an executive summary that summarizes the findings of the energy audit. Saving in KWh, reduction of CO₂, and simple payback period for implementing each quantitative assessment

recommendation will also be provided. Description of the facility, details of the analysis conducted will equally form part of the report.

6. Deliverables

Final report to include but not limited to the following findings: Energy saving opportunities; possible solutions to identified problems; Savings (SAR, kWh, CO₂ reduction, and simple payback period); Assessment recommendations (quantitative and qualitative) will be submitted to the client. A power point presentation will also be made for TAQA.