

CHAPTER V

CONCLUSION

5.1 Conclusion

- 1) The EnMS was designed to optimize energy consumption from the beginning of operations, ensuring efficiency without relying on historical data. This system includes a detailed energy consumption mapping that identified Natural Gas as the primary energy source, accounting for 53% of total energy consumption, and the Texturization Plant as the largest electrical energy consumer at 62% of the total electrical load. The EnMS framework incorporates clearly defined policies and structured responsibilities across four hierarchical levels: Top Management, Energy Management Coordinator/Technical Staff, Steering Committee, and Plant Energy Management Coordinator. Management validation has confirmed the system's practicality and alignment with industry best practices, while also identifying opportunities for further refinement in energy reporting templates and ISO 50001 certification requirements.
- 2) A structured framework for continuous energy efficiency improvement was created, through the integration of the Plan-Do-Check-Act (PDCA) cycle. This framework enables systematic performance evaluation and optimization, supported by baseline data derived from plant design specifications. The analysis revealed that the current designed Specific Energy Consumption (SEC) of 2,168 MWh/MT significantly exceeds the BAT-FDM benchmark of 0,45 MWh/MT for stand-alone refining, presenting clear targets for improvement. The framework sets realistic improvement goals of 10% energy savings for initial implementation and 1-2% for subsequent improvements through active energy management.
- 3) A set of relevant and measurable Energy Performance Indicators (EnPIs) was defined and tailored specifically to the refinery's processes. These EnPIs are essential for effective monitoring of energy consumption across the key

production areas, including refining, fractionation, hydrogenation, and texturization. With EnPIs such as energy intensity and process-specific indicators, the system can track energy performance.

