Executive Summary

Arches etc. is a San Diego business, which specializes in the manufacture, distribution, and installation of custom designed doors, windows, mouldings, and hardware. Due to the recent economic downturn, which has hindered the construction industry, Arches etc. believed that an analysis and optimization of their energy usage would provide additional assistance towards their goal to lower overhead and maintain current operations.

To begin this task, a comprehensive energy audit was conducted to establish an initial state from which to base improvements. Arches etc.'s current monthly utility bill averages $996, which solidifies the accuracy of this project's performed energy audit, estimating their monthly consumption to be $985. With this energy audit as baseline to build upon, several aspects of their facility were analyzed, including: Manufacturing Processes, Equipment Capacity, Equipment Runtime, and Equipment Efficiency. After developing a collection of proposed improvements based upon these areas, the economic justification of each improvement was evaluated. Free energy saving improvements, or those that did not require an initial investment, resulted in an estimated annual savings of $2,000. Additional savings were found through equipment investment opportunities, resulting in annual savings of $958. Investment opportunities were evaluated on their payback period and Net Present Value. Investments that offered a positive NPV were included in the final recommendations. It has been recommended to Arches etc. that through implementation of these various energy saving improvements they can reduce their monthly electric utility bill by at least 26%. This reduction has the capability of bringing their current monthly electric bill from $996 to $739. To complement these improvement recommendations, Arches etc. has also been provided a series of observational energy efficient guidelines to conserve electricity throughout their facility.