South Carolina
Economy - Energy - Environment

ENERGY CONSERVATION REPORT – SAMPLE RECOMMENDATION

Convert Propane Forklift Fleet to Electric

RECOMMENDATION 6: Replace Propane Forklift Fleet with Electric

Est. Energy Cost Savings	=	***$1,707.18***	***per forklift per year***
Est. Cost of Propane	=	***$27,406.80***	***per year***
Est. Cost of Electricity	=	***$0.0689***	***per kWh***
Est. Salvage Value of Propane Forklifts	=	***$16,500***	***per forklift***
Est. Cost of Electric Forklift	=	***$ 31,000***	***per forklift***
Est. Total Cost Savings	=	***$17,071.80***	***per year***
Est. Implementation Cost	=	***$125,000***	
Simple Payback Period	=	***8.49***	***years***

Recommended Action:

It is recommended to replace the existing propane fueled forklifts with electric forklifts at the facility.

Background:

The facility currently has a forklift fleet of 12 electric powered and 10 propane fueled forklifts. Electric forklifts are less expense to operate and maintain, as well as being better for the environment. The fact that the company already has converted 12 of their forklifts to electric means that they already have some if the infrastructure in place for this to be a swift and easy transition.

Anticipated Savings:

First, the amount of money that the facility spends per year on propane had to be calculated. This was done by researching the average national coast of wholesale propane, which was $0.993 per gallon. Next, was to find out what the facitlity would spend on added electricity for this upgrade. The average cost of industrial electricity in South Carolina is $0.0689 per kWh. Finally, according to the Electric Power Research Insititute, the average forklift consumes 15,000 kWh of electricity per year. These calculations were done assuming a 5000 pound load capacity and 2000 operating hours per year.

$$Annual\ Cost\ of\ Propane\ \left(\frac{\$}{year}\right) = C \times \varepsilon \times T\ \times N$$

Where:

C = Cost of Propane ($/gallon)
ε = Fuel Efficiency of Forklift (gallon/hour)
T = Run Time
N = Number of Forklifts

Calculating the annual cost of propane for the facility gives us:

Annual Cost of Propane = $27,406.80

$$Annual\ Cost\ of\ Electricity\ \left(\frac{\$}{year}\right) = C \times T\ \times N$$

Where:

C = Cost of Electricity ($/kWh)
T = Run Time
N = Number of Forklifts

Calculating the annual cost of electricity for the facility gives us:

Annual Cost of electricity = $10,335.00
Annual Difference in Energy Cost = $17,071.80

Without the knowledge of what existing propane forklifts the facility possesses, the average salvage value of a used propane forklift was found to be $16,500. The average cost of a new electric forklift was found to be $31,000.

$$\boldsymbol{Total\ Salvage\ Value} = \$16,500 \times 10\ \boldsymbol{forklifts} = \$165,000$$
$$\boldsymbol{Total\ Transition\ Cost} = \$31,000 \times 10\ \boldsymbol{forklifts} = \$310,000$$
$$\boldsymbol{Net\ Transition\ Cost\ (NTC)} = \$165,000 - \$310,000 = -\$145,000$$

Simple Payback Period:

The simple payback period (SPP) is calculated as follows:

$$SPP = \frac{NTC}{A}$$

Where:

SPP = Simple Payback Period (years)
NTC = Net Transition Cost ($)
A = Annual Energy Cost Savings ($ per year)

$$SPP = \frac{\$145{,}000}{\frac{\$17{,}071.80}{yr}}$$

SPP = 8.49 years