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ENVIRONMENT



Converting To Electric Trucks

Distributor offers tips to help customers make the switch.

By Michael Sain

When a lift truck user's equipment reaches the end of its useful economic life, it is time for the fleet to be replaced. At Material Handling Inc., we have been making a concerted effort to switch our customers from internal combustion lift trucks over to electric lift trucks since the early 1980s.

We've been able to do this effectively, in part, because we utilize the latest technologies and methodologies from our in-house battery and charger division and combine these with the appropriate electric truck for the application. Whether we use fast charging, standard charging, high-frequency charging or a combination of all three, the goal is to eliminate battery changing. I realize that most forklift dealerships are not also battery and charger dealerships, but a partnership with your battery and charger supplier can still achieve many of the same things.

You can help your customers realize the benefits of converting to electric fork trucks by following some of the principles outlined in this article.

Choosing a Target

In our experience, the best accounts to target are users of internal combustion trucks that run multiple shifts. This is important because a light, one-shift operation can rarely generate a return on investment fast enough. The upfront cost of the electric truck, battery and charger, compared to a propane truck, is significant, so a fast ROI is important. Therefore, we look for an LP, cushion-tire, multi-shift operation.

Once we've targeted the potential customer, we outline the benefits for them, dividing the list into hard costs and soft costs. Hard-cost benefits are those we can easily measure and calculate for comparison to their current operation. We term soft costs as those benefits that exist, but may vary in economic importance in various companies. Some examples include overall environmental impact and noise pollution.

Hard-Cost Benefits

The four areas of hard-cost benefits we present to customers are fuel consumption, maintenance, equipment life and operator productivity.

Fuel – Since electric trucks run on batteries, and normal recharge costs are less than 20 percent of the equivalent propane costs, customers can avoid paying for the more expensive fuels.

Maintenance – It is well-documented that electric trucks require substantially less maintenance. The engine, transmission, fuel system and even regular brake jobs are eliminated from the maintenance equation with electric trucks.

Economic Life –The economic life of an electric truck is about 20 percent to 30 percent longer than an IC truck due to the drastic reduction in moving parts. So an IC truck with a life of five years equates to an electric truck with a life of six or seven years. Whether the customer purchases or leases the truck, the annual cost to operate that piece of equipment is lower.

Productivity – In a multi-shift operation, the driver stops what he's doing and takes his truck to either change or refill the fuel tank. The time it takes to do that is non-productive. We design the charging systems to work so that the electric truck's battery is recharged during the operator's already-scheduled breaks, eliminating the productivity loss from refueling. This is a hard number that you can calculate by studying how many minutes it takes to change a tank, how many pieces of equipment the customer has, how many times a day they change it, multiplied by the average hourly cost of an operator. That cost is eliminated by switching to electric trucks with no battery changing.

Soft-Cost Benefits

In doing these conversions for a number of years, we have discovered many soft costs that have varying levels of impact, depending on the customer. These are costs that are more difficult to put a dollar value on, but are benefits nonetheless, and we make sure clients are aware of them.

Emissions – At the majority of manufacturing and distribution facilities, forklifts work dock areas. If it's cold and the docks are sealed, traffic from multiple trucks going in and out can cause quite a build-up of carbon monoxide. Electric trucks have zero harmful emissions, eliminating this problem.

Environmental Impact – The environmental impact of an electric truck is more than just not having emissions. Electric trucks also don't use engine oil, transmission fluid, radiator fluid and filters that have to be changed on a regular basis. These waste items are very harmful to the environment. By operating an electric truck with a typical lead-acid battery, this waste is eliminated. One hundred percent of our battery waste is recycled. The lead goes to a smelter to be reused, and the acid is neutralized to a pH balance where you can drink it (though I don't recommend it!). When you consider hydroelectric, wind and even solar power, the generation of electricity has less environmental impact than any fossil fuel.

Noise – The reduction of noise pollution in the workplace is becoming an important concern for many of our clients. At one of our accounts, employees that worked in and out of trailers on IC trucks were complaining of ringing in the ears. We conducted noise studies with a decibel meter, measuring the loudness of the IC truck at the driver's ear when entering the trailer. Using this information compared to the drastically reduced noise levels from an electric truck, we were able to help make the right decision to better the workplace environment.

Supply Chain Initiatives – Over the last few years, big-box retailers like Wal-Mart, Home Depot and Lowe's have been mandating that the businesses providing products and services to them are green in their own operations. These retailers are forcing the conversions down the supply chain as companies who supply them are adopting green technology wherever they can to conform. We advise our clients who supply these companies to move toward compliance by switching to electric trucks in their operations.

Utilities – At MHI, we have worked with local utility companies to provide our clients an additional monetary incentive for changing their LP or gas fleet over to electric. A changeover may increase the client's electric demands, but some utility companies are willing to negotiate an overall lower rate because of that increase. That not only drives down what the customer pays for the electricity for the forklifts, but it applies to the rest of the electric bill as well.



Customers of Material Handling Inc. are encouraged to switch to electric trucks to help the environment and their own bottom line.

Most of the time, when we compare the annual costs of running a conventional propane fleet against an electric fleet and power system designed by MHI, it will reduce operating costs anywhere from 35 percent to 40 percent over the economic life of the equipment. That figure accounts for all the costs on the front end, including the purchase price, plus all the hard costs. When people see that figure, it's usually enough by itself to make the project a priority.

Three Hurdles to Overcome

Despite all the aforementioned benefits of electric trucks, there still have been reasons why some customers choose not to switch. Some of these hurdles have been addressed in recent years.

1. Older electric trucks could not perform as well as IC trucks. Today, because of AC motor technology, electrics are able to perform side by side with IC trucks. The North American standard is still for 36- or 48-volt electrical systems,

which can perform as well as internal combustion trucks. We've also found success using trucks with 80-volt systems. We installed an 80-volt fleet into a carpet manufacturer's facility a few years ago, and have seen great success with this technology.

Occasionally, we must prove the capabilities of our electric trucks to the uninitiated. When we come across a real doubting Thomas, we take our 80-volt truck and chain it to the end-user's existing IC truck. Then we have the operators of each machine hit the gas pedal at the same time, and the 80-volt truck will pull the IC truck all over the warehouse! That wasn't possible ten years ago, but now these trucks are very powerful.

2. Can electric trucks get wet? In the past, you never wanted to get an electric truck wet. Now, we have electric trucks with pneumatic tires on them that are designed to go outside, travel up and down ramps, and operate out in the rain. It is easy to put a cab on a truck for use in wet conditions. All those past restrictions are now gone.

3. Battery changing. Someone with a fleet of propane trucks may say, The numbers make sense, but I don't have the space to put a battery room in here. Square footage is expensive, to say nothing of the equipment needed to change the batteries. Well, with the advanced charger technologies, we're able to eliminate the need to battery change because we are refueling the battery during the driver's breaks, lunch and shift changes. We've eliminated the need for a battery room and battery change.

From 3,000 pounds to 12,000 pounds, about 80 percent of the IC trucks on the market have a direct electric replacement with no loss in performance and gains in productivity and operational costs.

On-Site Testing

As the distributor, this conversation cannot take place strictly on paper. To prove to the customer that your suggestions aren't just lip service, I suggest on-site testing of the electric equipment. At MHI, we do an energy audit of the particular pieces of equipment in the specific application. It could take three days or it could take three weeks, but we'll test until we have enough data and feel confident that what we propose is best for the customer. We won't provide a proposal until we're sure.

Thanks to this method, we have not had a conversion that wasn't 100 percent successful. Of course, there have been plenty of times where the end-user doesn't buy in and commit from an operations perspective. We don't sell to those users, because to be successful, the attitude and commitment must start from the top.

After the Sale

Once the customer makes the decision to make the conversion, we handle the trade-in equipment just as we would if it was a direct replacement. In other words, we take their old IC fleet in on trade by writing them a check for the value of the equipment, or apply a credit to the equipment that's going out. Then we either dispose of them via retail, wholesale or rental.

After the new equipment is delivered, we train the operators and oversee the implementation of the equipment. We continue to gather data and run reports to make sure the operators are following the system as designed. If we design a system to charge the trucks when the operator goes to break, it's up to the operators to actually plug in every time. If they don't, then the system won't work as planned. We can go in and download data from the chargers to tell us whether they're complying. That after-the-sale attention helps ensure the success of the project.

Converting your customers re-quires a lot of homework and good understanding of how each type of truck, battery and charger all work together for that specific application. The distributor is responsible for putting together the best combination that yields the lowest operating cost for the customer. But understanding the principles laid out here is a good first step along the journey.



Material Handling Inc. negotiates with customers' local utility companies to drive down what the customer pays for electricity, providing additional monetary incentive to change their fleets to electric trucks.



Meet the Author

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