



TOP FIVE QUESTIONS TO ASK BEFORE PURSUING INDOOR FORKLIFT ELECTRIFICATION

Demanding industries like trucking and manufacturing have long relied on internal combustion engine (ICE) forklifts, even in indoor settings. That's changing. Electric motive power is increasingly popular among high-intensity operations, and electric options for forklifts are no longer limited to lead-acid batteries. The opportunity is there, but what should you know about electrification of indoor forklift applications?

1 // ARE INDOOR OPERATIONS REALLY MAKING A SHIFT TO ELECTRIC?

According to data from the Industrial Truck Association, retail bookings for electric counterbalanced (class 1) forklifts are outpacing bookings for ICE counterbalanced trucks with cushion tires, primarily intended for indoor applications (class 4). Since 2014, purchases of electric counterbalanced trucks have increased by 82%; during the same period, ICE counterbalanced cushion tire purchases have only increased by 33%. Subject matter experts expect this trend to accelerate in coming years as states like California implement more stringent air-quality regulations.

PURCHASE INCREASE SINCE 2014

Electric counterbalanced

+82%

ICE counterbalanced
cushion tire

+33%

2 // CAN ELECTRIC POWER OPTIONS REALLY OFFER COMPARABLE PERFORMANCE TO ICE?

The legacy electric motive power source, lead-acid batteries, possesses certain characteristics that hinder its ability to deliver performance on par with ICE, especially for power-hungry indoor applications:

- Lead-acid batteries are generally too large and heavy to be adequately scaled up to satisfy the energy draw of a high-capacity lift truck.
- Power output diminishes as a lead-acid battery's charge depletes.
- Charging a lead-acid battery is space-intensive and time-consuming, requiring about 20 minutes for the operator to switch out the battery, followed by approximately 16 hours of charging and cool-down time.

By contrast, newer electric options like hydrogen fuel cells (HFC) and lithium-ion batteries provide consistent power until depletion, putting them more in line with ICE performance. Hydrogen fuel cells also have a similar operating profile as ICE from a time and convenience standpoint, often taking only three to five minutes to refuel. Lithium-ion and thin plate pure lead (TPPL) batteries offer faster charging times than traditional lead-acid and are designed for opportunity charging. And if you think electrification options might be insufficient or unproven for heavy-duty demands, think again. Hyster already offers electric power options for equipment with much higher capacities than most indoor forklifts, including those with load capacities up to 36,000-pounds powered by integrated lithium-ion.





3 // WHAT ARE THE BENEFITS OF SWITCHING FROM ICE TO ELECTRIC?

All electric options can help your company meet regulatory standards and reach emission reduction goals. Lithium-ion, TPPL and HFC produce zero harmful emissions, while lead acid does emit some gassing during charging. Deploying a truck fleet that doesn't emit smells or greenhouse gases can also help enhance working conditions for your operators, who benefit from improved air quality and reduced noise levels of electric relative to ICE, especially in indoor settings. While all lift trucks require maintenance, the maintenance requirements associated with particular power sources vary. Electric drivetrains have fewer components and less complexity than ICE, and one particular electric power source, lithium-ion, requires zero battery maintenance or equalization. The reduced maintenance requirements and workload associated with electric trucks can be an important aid for businesses.

THERE'S EVEN MORE UPSIDE TO ELECTRIFICATION

Gain access to systems that are not available on ICE trucks, like Hyster Reaction™. This solution for intense indoor operations helps support operator awareness and adherence to safety best practices by alerting the operator and automatically adjusting forklift performance like speed or lift based on truck stability, facility rules and proximity to obstacles, people and other trucks.





4 // WHAT ARE THE CONCERNS?

Electrification can present advantages for many facilities, but every operation is different. Several factors influence appropriate motive power choice, including operating time, temperature, space availability, cost tolerance, local utility grid dependability and relevant emissions requirements. For example, operations located in areas with weak electrical grids are more prone to experience brownouts that could temporarily grind work to a halt, particularly when charging lithium-ion powered equipment. Likewise, going electric may require your facility to dedicate extra space for battery storage or to upgrade its electrical and other infrastructure in order to support the necessary chargers or dispensers. Make sure you recognize the goals, needs and limitations of your indoor operation before pursuing electrification.

5 // COMPARED TO ICE, IS GOING ELECTRIC GOING TO BREAK MY BANK?

Electric power options range in cost from one type to another and will also vary depending on the particulars of your location and operation. Taking advantage of available grant and incentive programs can help offset the costs of electrification. Programs and opportunities will vary by state, but resources are available to help make the conversion to electric more financially appealing. Rightsizing lithium-ion batteries and chargers to your infrastructure and operational needs can also help contain costs, as overestimating the size of the battery and charging speed needed to accomplish your goals can lead to unnecessary overspending. Estimating and comparing not just the initial acquisition expense, but the total cost of operation over the life of the truck, including factors like energy spend, maintenance, space and labor costs, can help you to arrive at the most cost-effective power solution for your unique operation.

For more information on electrifying your forklift fleet, talk to your local Hyster® dealer or visit the [power sources page](#).