Power Suite

Unlock the true power of your operation
The market offers more choices than ever to power lift trucks. But how can your operation choose the right one?
The Yale Power Suite

Yale offers its comprehensive range of lift trucks with a broad suite of power options. This enables customers the complete freedom to make a power decision solely based on their requirements, with access to leading edge technology.

**Hydrogen fuel cells**
Refuel in as quick as 3 minutes and get consistent power delivery with zero harmful emissions and minimal space requirements.

**Lithium-ion batteries**
Take advantage of simple opportunity charging, zero battery maintenance and consistent performance in a wide range of temperatures.

**Lead-acid batteries**
Get up to speed with lower initial acquisition costs and multiple battery choices with the original electrification option.

**Internal combustion engines**
Experience consistent, high power suitable for even the toughest jobs, with fast refueling and exceptional reliability.

Yale provides the consultative expertise you need to make the right choice for your operation, backed by real-world experience with each power option.
Quality employees are more difficult to find and retain than ever, pressuring operations to maximize operator productivity. For a turnover-prone workforce, reduced power source involvement from operators means easier training.

Operations risk premature power source failure if maintenance, charging and refueling procedures are not followed – but requirements range from simple to complex. Simpler, low-maintenance power options are easier to train on and can boost productivity by allowing personnel to stay focused on the task at hand.

Growing order volumes mean many facilities need to squeeze more capacity from existing square footage – even with narrow aisle storage reaching up to the ceiling.

Power sources all require refueling infrastructure or a charging and changing framework, but some require more space than others.

Whether due to government regulations, industry standards or corporate initiatives, many operations must keep an eye on airborne contaminants.

Lift truck power sources have different levels of emissions, as part of regular operation or as a result of off-gassing during the charging process.
With the right power source, you can address operational challenges and unlock greater levels of operational efficiency.

**Electrical grid requirements**

Some geographic areas may be unable to handle the demands of charging lift truck fleets or accumulate excessive peak usage charges.

Operations have a variety of options to address these limitations, like staggering charging schedules to balance the load and control costs, financing utility projects or selecting a power source with minimal dependence on public utilities.

**Excessive inventory of trucks, power sources**

To mitigate the risk of not having enough trucks or batteries during peak times, operations are often forced to have additional equipment on hand, adding additional cost and space requirements.

An efficient fleet with a 1-to-1 lift truck to power source ratio happens by understanding how long and how often lift trucks must run, and the environment in which they operate. For example, a multishift operation that spans both ambient and refrigerated environments has different power requirements than an outdoor, single-shift operation.

**The Yale Power Suite approach**

The Yale Power Suite approach starts with gauging your operation’s challenges, collecting data and evaluating equipment, then a potential technology test drive. Ultimately, this produces a best-fit power solution.
## Power source comparison

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Space requirements</th>
<th>Maintenance</th>
<th>Local utility requirements</th>
<th>Required operator involvement</th>
<th>Sustained power delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydrogen fuel cells</strong></td>
<td>No harmful emissions; only water vapor and heat</td>
<td>Space-efficient infrastructure; storage can be located outside facility with dispensers located indoors or outdoors</td>
<td>Moderate maintenance requirements</td>
<td>None, though refueling system may have requirements</td>
<td>Simple, fast refueling</td>
</tr>
<tr>
<td><strong>Lithium-ion batteries</strong></td>
<td>No harmful emissions</td>
<td>No specialized changing or maintenance rooms required</td>
<td>No maintenance or equalization requirements</td>
<td>More intense electrical grid burden, depending on fleet size and charge intervals</td>
<td>Designed for opportunity charging; faster recharge capability than lead acid</td>
</tr>
<tr>
<td><strong>Lead-acid batteries</strong></td>
<td>None while in operation, but does emit fumes that require ventilation during battery charging</td>
<td>Separate room, infrastructure often required for battery charging, changing and maintenance</td>
<td>Higher maintenance requirements compared to other electric options</td>
<td>Moderate electrical requirements, depending on fleet size</td>
<td>Complex and time-consuming battery maintenance, charging or changing</td>
</tr>
<tr>
<td><strong>Internal combustion engines</strong></td>
<td>Emissions while in operation. Well-suited for outdoor or highly-ventilated environments</td>
<td>Primary fueling and storage infrastructure located outside facility</td>
<td>Requires regular, but not daily, maintenance</td>
<td>None</td>
<td>Simple, fast refueling with tank changes or pump</td>
</tr>
</tbody>
</table>

### Sustained power delivery

- **Hydrogen fuel cells**: Consistent power delivery until full depletion
- **Lithium-ion batteries**: Consistent power delivery until full depletion
- **Lead-acid batteries**: Diminishing power output as battery charge depletes
- **Internal combustion engines**: Consistent power until full depletion