



## Does LPG Dependence Jeopardize Your Operational Resilience?

LPG price volatility has been extreme. Relying on it to fuel your operations poses risks.

In the face of political instability, stringent sustainability mandates and the many other challenges that occupy the headlines, supply chains are becoming increasingly focused on their resilience to threats posed by political and macro-market factors.

But a threat to operational resilience is slipping under the radar of Operations and Fleet Managers - reliance on LPG (Liquified Petroleum Gas or Propane) to power forklifts and other material handling equipment critical to operations.

Many operations choose LPG for fueling certain types of forklifts in their fleets. But as the recent pandemic has made apparent, LPG dependence introduced growing levels of volatility and risk in terms both of economic cost and supply chain reliability.

The operational pain caused by both LPG price swings and potential supply chain risks has many of these operations re-thinking their LPG dependence.

**451%** Range of LPG Price Changes  
*(since 2020)*

The costs of running an equipment fleet generally fall into three categories – equipment acquisition, maintenance and energy. Equipment acquisition costs tend to be fairly straightforward, especially if equipment is leased and maybe slightly less so if equipment has been acquired using borrowed money. Second, costs relative to maintaining equipment are also fairly predictable, albeit likely to rise with the age of the fleet. As a result, both acquisition and maintenance costs are relatively easy to project out over the expected service life of the fleet. But trying to predict the third category, energy costs, over that same service life period of five to seven years (and often significantly longer), poses a lot more risk to operations.



## LPG Supply Restrictions

LPG is predominantly derived from natural gas and byproduct from oil exploitation ([76% of propane is refined from natural gas](#)). As a result, LPG pricing is directly linked to oil and natural gas prices, themselves becoming notoriously volatile. But that link is far from straightforward and many other supply and demand factors come into play.

Production and availability can be curtailed for a number of reasons. There is the risk of technical outages at one or more of the relatively small number of processing plants or port facilities. Oil and gas production itself can be restricted by countries or producers for various reasons.



Oil and gas refiners have options on the balance of other products they produce – gasoline (petrol), diesel, aviation fuel, feedstocks for chemical industries and others. So LPG is one of many products that are in line to be produced based on the same limited stream of raw stocks. In addition, LPG's priority within this mix depends on a host of other factors outside control of both the refiner, everything from economics to politics to agreements restricting export – all directly affecting LPG supply and resultant end-pricing to Operations and Fleet Managers.



**76%** of LPG Comes from Natural Gas

LPG also has to be shipped to markets via large, highly specialized vessels, further constricting the overall flow of LPG product into end-user markets and adding more cost based on their own supply and demand curves. In September 2023, the maritime market intelligence company VesselValue reported that single year charter rates for large LPG vessels [more than doubled](#).

Later in the channel, the LPG supply that makes it into the market is further divided based on types of use and the profit margins associated with them. In totality, forklift fleets constitute only a small part of the LPG market. The consumer market, for cooking and heating, is large and is of course a political priority in many countries. Demand in many territories is highly weather-dependent – another source of unpredictability.

Commercially, LPG is used to power other types of equipment, including back-up generators and in the processing of metals and other materials (both as a fuel and as a feedstock). In Latin America, LPG is beginning to be widely adopted as an automotive fuel and the global maritime industry is increasingly looking to LPG as well. All of these large-scale applications are competing for the same LPG inventories as the comparatively small segment of forklift fleets – affecting availability and pricing.

## Volatile LPG Price Fluctuations

Given all these competing supply and demand issues and their resultant effects on end-pricing, budgeting for the cost of fueling a forklift fleet with LPG is complex and risky - considering the decision you make today will affect your operational costs for the next five-to seven years, based on equipment life. Especially when you consider that errors in future budgets are multiplied along with the size of the forklift fleet.

While price fluctuations across all forms of energy are inevitable, they have been recently extreme for LPG. Since 2020 the [range in price swings has been 451%](#). Of course, electricity prices also vary somewhat, but market prices have not experienced near LPG's level of volatility and there is very little international competition for generated electricity. In addition, to contrast LPG, there



are several commercially viable methods in practice to produce electricity.

So on cost alone, committing to LPG poses significant risk that increases in unpredictable ways over the service life of your forklift equipment.

## Breaking LPG Dependence

Recent advancements in battery and charger technology now provide alternatives to LPG that rival its material moving performance

while mitigating energy volatility risks while even helping reduce ownership costs. There are variants of battery technologies, but the mainstream, proven ones include traditional lead-acid, thin plate pure lead (TPPL) and lithium-ion.

Each of these battery technologies has its own set of characteristics and can be selected based on a variety of factors – ranging from acquisition cost to workloads and shift patterns to maintenance requirements.

This range of choices gives Operations and Fleet Managers unprecedented levels of flexibility in terms of powering electric equipment – far more than single-option LPG. This range of forklift battery technologies also facilitates



“true optimization” - enabling Fleet Managers to mix and match different technologies based on energy demands of varying equipment types, or even different departments within the same facility.

In addition to mitigating the risk of cost volatility, there are also operational efficiencies to be had versus LPG – eliminating time-consuming and hazardous tank changes that typically occur during productive work period. In contrast, certain batteries are designed to be “opportunity-

charged” during breaks and between shifts to keep them topped-up in terms of charge level.

But the key to successfully selecting the optimum mix of battery technologies (and their chargers) rests in being able to convert your LPG usage into the electric equivalent and factoring that with other operational factors such as expected throughput changes over the five to seven year expected fleet service life, sustainability requirements (emissions and water usage reductions, etc.), maintenance requirements and more.

## Smooth Conversion to Electric

Converting to electric can mitigate the risks that are increasingly apparent with using LPG as the energy source for your forklift equipment. At EnerSys®, we can help you explore electric options by starting with an analysis of your current and projected fleet energy usage (converting fuel usage to its electrical equivalent) and simulation of your operation’s power demands - identifying optimal battery and charger alternatives across all three proven battery technologies.

Our comprehensive portfolio and operational-focused approach enables you to make data-driven selections to achieve that elusive “true optimization” for your forklift fleet’s power. We can help you move from LPG cost volatility and risk to a more stable, sustainable and resilient operational environment. Contact us today for a site-specific review of your energy needs and conversion options.



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