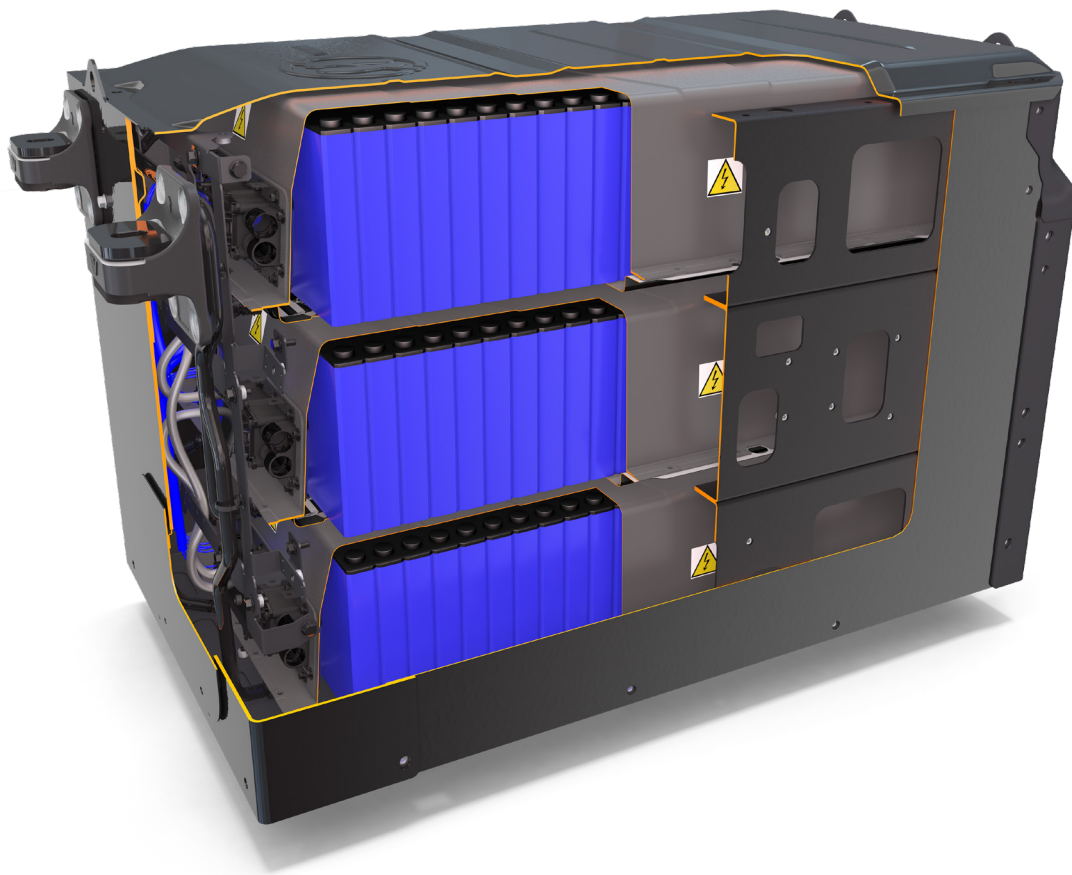


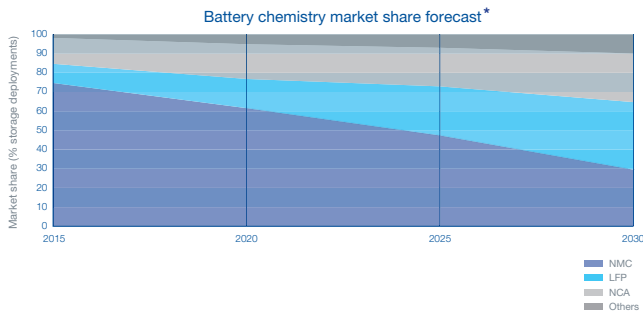
# The power of LFP batteries



Electricity will inevitably be a part of the future of logistics. DAF, therefore, has a complete range of DAF electric trucks, equipped with safe and durable high performance LFP technology batteries. As one of the first manufacturers, DAF has elected to adopt this technology. What makes the LFP technology a perfect fit for transport solutions? Allow us to explain.

## Technology

Nearly every electric vehicle currently in production is fitted with high voltage lithium-ion battery packs. It's just a very small, however essential, part of the battery that consists of lithium-ion. There are various different chemical compositions for the other, far bigger, part of the battery cells, each with its own benefits. NMC (Nickel, Manganese, Cobalt) currently holds the biggest market share, while NCA (Nickel, Cobalt, Aluminium) has also been adopted by some manufacturers, offering slightly improved capacity. The fastest growing technology, in terms of market share, is LFP (Lithium, Iron, Phosphate). This is mostly due to its cost savings, high charge rate, safety, lifespan advantages, and the fact it hardly contains rare earth materials, compared to other compositions.



## Safety

One of the major benefits of LFP, or LiFePO<sub>4</sub> batteries, as they are chemically described, is their superior thermal and chemical stability. Thermal stability is the main ingredient why LFP chemistry is intrinsically safer than its competition and is recognized as the chemistry with the lowest risk of being critically damaged, even during the event of a collision or by short-circuiting. Simply put, it is the most robust and safe battery technology available.

## Durability

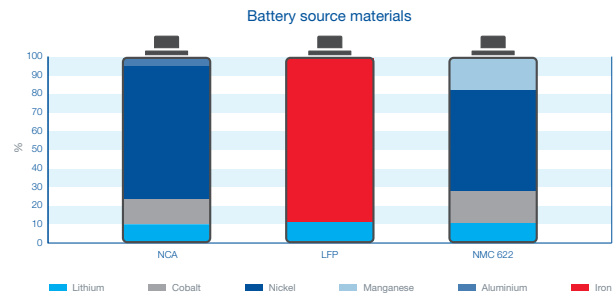
Most important for the durability of your electric truck, is the lifespan of its batteries. How long will they hold on to their capacity? LFP batteries can last up to five times as long, in terms of charging cycles, as NMC or NCA batteries would. LFP batteries also suffer less from higher temperatures and fast charging or discharging rates, meaning they can cope better with high loads and fast charging.

## Capacity

While LFP cells might not offer the same capacity to weight ratio as other technologies, the fact its thermal properties allow the cells to be packaged much closer to each other, makes up for it. This so-called cell-to-pack-ratio is especially high for LFP batteries, meaning the total capacity of the battery packs can compete with other technologies.

## Futureproof

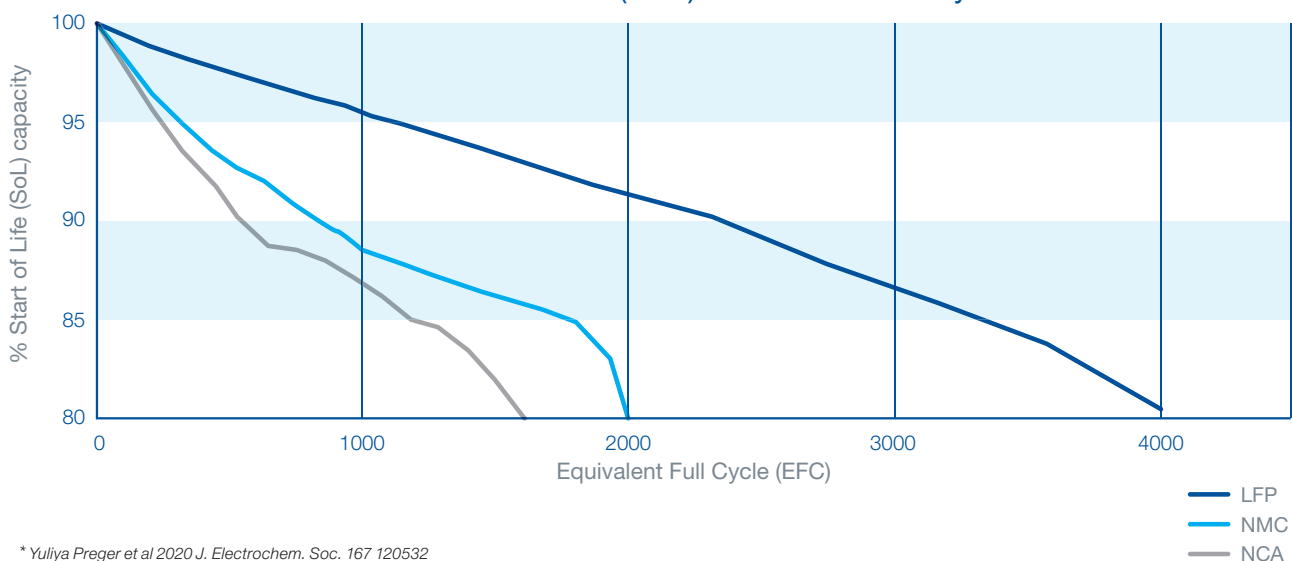
Last, but not least, LFP batteries are in many ways the most futureproof battery technology. One of the main reasons for its recent surge in popularity is the fact it doesn't contain cobalt, a toxic ingredient. There are also numerous other rare earth materials that aren't used in LFP-batteries, such as nickel and manganese, which require much more effort to obtain, and cause more harm to the environment.



## Second life

Clearly, LFP batteries offer the best safety and the required performance without having to compromise on capacity. It offers by far the best durability both to its drivers and fleet owners, as well as being the most sustainable solution. Even after the batteries have run out of their useful life for long haul, current expectations are that the same trucks will be used for shorter distance, distribution applications. Furthermore, LFP batteries, due to their stability, are expected to become a preferred chemistry for stationary applications.

**Estimated State of Health (SoH) of different battery chemistries \***



\* Yuliya Preger et al 2020 J. Electrochem. Soc. 167 120532