Electric GSE gains supporters but lacks support infrastructure

The technology is evolving and improving, but a limited number of charging stations on the ramp and apron holds back widespread adoption in Europe. *Barry Cross* reports

Pressure to comply with environmental legislation, a growing need to be seen as "green", and more affordable or convenient technology means that many airports are reassessing their policies towards how ground support equipment (GSE) is powered.

Until recently, diesel was the fuel of choice for airport GSE operators. Despite the development of cleaner engines and regulatory mandates to use them, a paucity of charging stations – and the prohibitive cost of putting them in place – held back the displacement of diesel by electric vehicles. Now, the rise of the lithium-ion battery, which facilitates opportunity recharging, means that airports are more attracted to electric solutions. Fully electric or hybrid GSE forms the cornerstone of greenhouse emission-reduction programmes in progress at hubs such as Frankfurt, Heathrow, Hong Kong, Changi, LAX and New York JFK, to name but six.

Franz Bühler, engineering director at German tow tractor manufacturer VOLK, told *Jane's* that electric vehicles are "definitely the way forward" for most airports, in preference to other innovations. "We did look at fuel cells, but nobody was interested. We developed the technology and went as far as building a prototype, which then underwent airport trials for about a year. But that was it. It appears that airports don't really understand that type of technology."

VOLK now builds diesel and electric versions of most tractors in its range. According to Bühler, electric vehicles are easier to handle and maintain. "We are using lithium-ion batteries… Although lead-acid batteries can also do the job, we believe lithium-ion is the future, because you can put more power into a lithium-ion battery in a shorter period of time," he said.

Operators of GSE powered by lead-acid batteries must switch over packs when the batteries are fully depleted. Lithium-ion offers two other possibilities for recharging: regenerative braking and opportunity recharging during downtime. A lithium-ion battery will last for about five years, which Bühler said is about double the life of an ordinary battery. Recharging time varies with the size of the battery and the type of recharging equipment used.

"Opportunity recharging is much easier with the lithium-ion battery," he remarked. "Because of that, we are seeing more airport [GSE] operators using opportunity recharging, rather than undertaking a total recharge overnight."

VOLK EFZ-30NT electric baggage tractor. (VOLK)

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Bühler added that electric vehicles are proving to be cheaper to operate than their diesel counterparts, because the price of batteries has come down. "The problem with diesel engines is the 'Tier' norms, which add more technical aspects to a tractor's exhaust systems," he said. "The result is that a diesel engine nowadays costs twice the price of what it was ten years ago."

Charging points

A lack of recharging points remains the main barrier to adopting electric GSE, especially at space-constrained airports, although this issue is being addressed. In the United States, for example, the Federal Aviation Administratiion's (FAAs) Voluntary Airport Low Emission (VALE) and Zero Emissions Airport Vehicle (ZEV) programmes include grants to install electric charging.

Individual airports elsewhere in the world are rolling out infrastructure. Recent examples reported by *Jane's* include Schiphol, which is using the proceeds of its first green bond to fund electric charging points for GSE (in addition to other environmental measures). TCR, the leading independent owner of GSE assets in Europe, has converted about 50% of its motorised fleet to electric power, and CEO Tom Bellekens noted that the company is developing an indigenous recharging capability for airports where it has a strong presence.

Almost every applicant for VALE or ZEV funding is awarded a grant, so it makes sense for many US airports to replace diesel GSE with electric alternatives as soon as these become available. This is bad news for US company Minit Charger, which has developed a charging system based on spare electric capacity on passenger boarding bridges. To date, only two US international airports – Oakland and San Jose – have acquired the passenger boarding bridge- (PBB-) based system, and Minit Charger sales representative Tim Wix lamented that it is unlikely other US orders will follow.

However, the company has sold units to Beijing Capital and Chengdu international airports in China, and it exhibited at inter airport Europe in 2017 specifically to raise awareness among potential European customers.

Wix noted that most PBBs are probably moved under power for less than an hour in any 24-hour period. The Minit Charger system is therefore connected to the PBB electrical supply system and monitors when they are available for other uses. "As soon as the PBB starts to move, our equipment senses this and shuts down the power supply to a GSE charging unit that we install," explained Wix.

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