THE MOTOR TRANSPORT AWARDS 2025

MT Awards 2025 winner profile

Best Use of Technology Award

Capacity for change

Flexible Power Systems has developed a smart platform that offers immediate fuel savings for transport refrigeration unit operators

Plugging your refrigerated trailer in to a depot and switching off the engine is a fantastic way to save money and cut emissions – and Flexible Power Systems has created a product that mitigates the need for immediate and costly grid upgrade.

Necessity is the mother of invention. For decades, transport refrigeration units (TRUs) could be powered electrically but there was little incentive to do this while companies were allowed to use rebated red diesel. However, with the removal of the duty exemption in April 2022 and the inexorable transition to net zero solutions, interest in electric hook-ups for TRUs has risen significantly.

According to technology company Flexible Power Systems (FPS), which develops solutions designed to synchronise the EV fleet eco-system, TRUs typically consume between 10% to 15% of a refrigerated HGV fleet's fuel use – and as much as two-thirds of this tends to occur in depot environments, due to engine idling and energy intensive activities such as temperature pull downs.

In a sector known for its tight profit margins, this is a significant amount of fuel consumption, equating to a lot of money and avoidable emissions – but now the tide has turned and there is an opportunity to make huge cost and carbon savings by simply plugging the TRU in. A flick of a switch to electricity can reduce running costs, particulate and noise pollutions and, according to FPS figures, it can also produce a 6% to 10% reduction in a fleet's Scope 1 carbon emissions, without requiring any major vehicle investment.

Except it isn't quite as simple as that.

FPS says its research and prebuild electric load modelling found that some fleet operators could theoretically have a couple of hundred hook-ups at their depot, which translates to a couple of megawatts of extra load, a hefty requirement for most firms. Many distribution centres lack the necessary grid connections or site energy capacity, let alone the infrastructure to support that amount of electricity usage.

In addition, fleets often don't have the monitoring capabilities required to measure the savings, which would enable them to justify capital investment in hook-up infrastructure.

Constant communication

Furthermore, it is difficult to monitor fault status remotely without also having suitable communication systems in place to ensure compliance. This is important; if an HGV driver arrives at a depot on a freezing January evening and believes the plug is broken, or the benefits of plugging in the TRU have not been explained, it's easy to see why they might choose to stay cosy in the cab and keep the engine running instead.

Therefore, infrastructure visibility is key.

So, FPS set to work designing a solution that addresses all of these challenges and the result is a smart plug-and-operate platform called TRU Fuel Saver, which has now won an MT award.

It took the digital platform it originally designed for managing electric van and truck fleets, FPS Operate and adapted it so that it could interface with TRU hook-ups and a newly developed 32 amp smart plug. The solution was created for sites with electrical capacity constraints and so it avoids an expensive grid connection upgrade and potential multi-year project delays.

FUTURE PROOFED

The TRU Fuel Saver system has impressive payback and FPS says it is scalable across a fleet of TRUs – but the smart plug has been designed with the future in mind, too. Because the smart plug relies on the same protocol as all EV chargers, this means the same FPS platform can manage a depot's fleet of EVs as well as a fleet of eTRUs.

Diesel trailers will be phased out in time and replaced with full-electric alternatives with their own battery storage. FPS says that with its own open charge point protocol interface and combined with on-vehicle telematics, TRU Fuel Saver can dynamically optimise eTRU charging via the smart plugs and ensure each trailer always has adequate charge.

"This allows us to maximise vehicle and charger up time by automatically handling and alerting the appropriate department of faults and optimising the cost of fleet charging with intelligent charge scheduling, reducing charging costs and installation costs," says Anne Gray.

"As well as tracking the performance of the fleet infrastructure, we can develop optimal rollout plans and identify operational improvements. Refrigeration energy demands are significant and are directly correlated to volume, mass and temperature, with site capacity constraints at greater risk of breach in hot weather," she adds. "Automation of energy load management via FPS' innovation means that the operational and financial consequences of energy breaches are removed, leaving commercial fleet operators to manage day-to-day operations."

There is an opportunity for broader integration too. "The temperature impacts of multidrop schedules and periods of high outside temperatures mean that integration of existing TRU temperature controllers can enable enhanced controllability," she says.

TRU Fuel Saver monitors and controls site power usage and prevents grid overload; if capacity is likely to be breached then the smart platform automatically identifies plugs that are connected to TRUs that safely can have their power switched off (eg TRUs equipped with diesel auxiliary engines rather than alternator drive).

It also continuously monitors electricity usage, fuel, emissions and the subsequent cost savings – essential if a business is putting together an investment case in order to secure funding for more plug-ins at depots. Its automated management flags up when bits of infrastructure are not working, so the aforementioned HGV driver does not find themselves wasting time attempting hook-ups in the dead of winter, and maintenance or training needs are easily identified, so everyone is aware of the kit's benefits.

Scalable solution

TRU Fuel Saver is designed to work with either conventional diesel TRUs or emerging battery-powered models and the company says this means it can ensure future scalability and sustainability.

"Its raison d'etre is working within capacity constraints," explains FPS corporate development executive Anne Gray. "How far can you get by working smartly? The energy demands of a TRU and an HGV mean that if you scale up the electrification of either then you can upgrade if there is the capability to, or you can try to work within the constraints you have.

"The main issue with an upgrade is the cost, it can be multi-thousands of pounds and there can also be a long wait; there are time and money factors to upgrading. Our software directs energy to the right place at the right time within an operator's constraints and it also enables tracking of energy utilisation and visibility of driver behaviour, so it's also looking at compliance training and looking after staff."

In order to design and test its solution, FPS has collaborated with Sainsbury's, as part of an innovation fund project, and Waitrose to develop a specification for TRU Fuel Saver that would be suitable for distribution centre operations across the UK. In Waitrose's case, its Aylesford depot operates more than 200 temperature-controlled vehicles from four separate warehouses, so the potential savings were clear.

The site had insufficient power for what it required to run, so 32 FPS smart plugs were installed, which created half a megawatt of load shift potential and avoided any grid upgrade.

The results were remarkable. FPS says deployment of its solution helped Waitrose deliver £40,000 per month per site in fuel savings, 100 tonnes of CO_2e savings each month and it also saved the business a couple of hundred thousand pounds on capital expenditure for less than the £30,000 investment – as well as help it avoid a two-year delay for a grid upgrade.

Jackie Hewson, alternative fuels implementation manager at Waitrose, says parent company the John Lewis Partnership has an ambitious commitment to eliminating fossil fuels from its fleet vehicles by the end of the decade. "Business as usual solutions won't achieve this, so we are committed to working collaboratively with innovators like FPS to overcome challenges to achieving this goal," she says.

MT's awards judges were similarly impressed. "FPS took an industry issue and, in collaboration with fleet operators, solved a problem that in the future will become even more acute. It did it in a way that is easily accessible, without big upfront infrastructure costs and easily scalable. The results are tangible and significant – £40,000 per month, and 100 tons of CO_2 per month all saved and this is just one facility. It has the potential to have a huge impact throughout the industry."

PLUG AND PLAY: FPS project manager Gareth Knapman with the company's smart TRU plug, which integrates with its digital monitoring software

Another described it as a practical technology that provided a stepping stone to carbon neutrality and made the best of both current technology constraints and practical constraints:

"Clear commercial and environmental benefits," the judge said. "A true innovation built upon collaboration between an SME and a high street chain delivering sustainability, benefits and financial value."

Increasing interest

Gray says a number of other companies have also expressed interest in the technology; with it being something of a pioneer in this area, it will undoubtedly attract the attention of other cold chain businesses. "We are not aware of a direct competitor to this innovation, but there are other ways for operators to reduce carbon when moving chilled products around, such as solar panels and electric TRUs," she says. "But we believe our product is complementary to those as well."

FPS describes winning the award for best use of technology as "a lovely recognition from the industry". Gray says that it recognises the fact that FPS solved a market problem that hadn't been addressed before; an invention born out of the sector's necessary move towards carbon zero.

"It's nice visibility of all the benefits it offers," she adds. "Not just the financial savings it provides for fleets, but also being able to do things in a smarter way with automated systems." ■