A COMMERCIAL MOTOR SUPPLEMENT

AT THE HEART OF THE MARKETPLACE

Commercial Motor

VOLTAGE VOYAGE
FL Electric illuminates drive from Blackpool to London

FOX ON THE RUN
How are the UK's first electric tippers performing?

PERFECT PARTNERS
Nationwide Platforms reaches new heights with Volvo Trucks

Silent running!

Volvo FM Electric sets the benchmark for the electric revolution

ROAD TRANSPORT EXPO

A special supplement with VOLVO

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ELECTRIC TRUCKS ON THE UP

A year is a long time in transport. Wind the clock back to June 2022 and we were delivering the first electric tippers into service with Fox Group – at the time, only our second electric truck customer in the UK.

Twelve months on, and we have signed deals for more than 150 electric trucks in the UK & Ireland alone, and almost 5,000 globally.

It's no longer just orders for ones and twos, either. DHL Parcel started the year with six Volvo FL Electrics for its London operations, and DHL Supply Chain has put four FM Electric tractor units on the road. Even Fox Group is back for more, this time FMX Electric Tridems.

Making the shift to electromobility might feel like a big leap, but businesses are taking these steps now because their customers expect it, and it's the right thing to do. Early adopters also stand to gain valuable experience of operating electric trucks which will prove crucial, given legislation demands that production of diesel rigids end by 2035, and diesel tractor units by 2040.

No matter your personal preferences, the market is changing. Battery electric (and later this decade, fuel cell electric) trucks will be a huge part of our future.

Our role is to help make your transition as smooth as possible – from defining the right truck to addressing concerns about charging, range, total cost of ownership and driver training.

Whether you deliver in or between cities, we can provide a zero-tailpipe-emission vehicle which is right for your business today. We'll assess your needs and help to turn them into a viable solution, backed by series production trucks – not prototypes. Plus, we'll help define a charging setup which matches your requirements for productivity and performance.

We stand ready to make your transition a success – and the necessary CO_2 cuts a reality.

Christian Coolsaet
MD
Volvo Trucks UK & Ireland

SILENT NIGHT

BATTERY-POWERED: **VOLVO FL ELECTRIC**

A silent 250-mile drive from a colourful English seaside town to London gave Will Shiers time to ponder over the future popularity of battery-powered trucks

WORDS: WILL SHEERS
PHOTOS: TOM CUNNINGHAM

Commercial Motor

Nicknamed "the Las Vegas of the North", Blackpool is home to the illuminations. For over 100 years British holiday makers have flocked to this seaside town to eat fish 'n' chips and marvel at the 6 miles of colourful lights.

Thanks to the Thunberg effect, Blackpool, like the rest of us, has had to clean up its act in recent years, and today the 1 million lights that make up the illuminations are powered by green electricity. This, to my mind, made it the perfect place for a photoshoot in a battery-powered Volvo FL Electric 16.7-tonner. Plus, I'm rather partial to battered cod and chips!

Firstly, I'll tell you now that I'm not convinced that battery power is the way to go for all commercial vehicles, at least not yet. As you well know, a Euro-6 diesel engine is incredibly clean, and in London (where my journey will finish), the tailpipe emissions from a modern truck are cleaner than the air people breath. Modern trucks are quite literally cleaning up the city. But whether we like them or not, zero-tailpipe-emission trucks are coming, and fast too. According to the UK government's 'Ten point plan for a green industrial revolution', all trucks with GVWs between 3.5 tonnes and 26 tonnes must be "zero emission" by 2035, and larger vehicles by 2040. That's all well and good, but these are just words. By this time next year I want to be driving around in a Bentley Flying Spur with Georgia May Jagger by my side, but just because I've said it, it doesn't mean it's going to happen! For electric trucks to be purchased in the volumes the government wants, a number of things have to happen.

First up is trucks, lots of them, and in numerous configurations. In this respect the vehicle manufacturers are starting to deliver the goods. While there's still some major gaps in their model line-ups, most do offer at least one zero-tailpipe-emission model. It's interesting to note that it's the old-guard truck makers who were first to market, and not the start-ups. Have you seen a Tesla Semi on UK roads yet?

Volvo is more advanced than most, and now offers a complete battery-powered range, from the FL Electric seen here, to the FMX Electric construction range, all the way up to the FH Electric 6x2 tag tractor unit.

BEHIND THE WHEEL

Ignoring the distinctive grille, the FL Electric doesn't look too dissimilar to its diesel-powered sibling from the outside, and the same is true behind the wheel. There's no central seating position or space-age dials and switchgear, which in my opinion is no bad thing. It's all just very functional and easy to get to grips with, which is exactly what you want if drivers are regularly changing between diesel and battery-powered trucks.

The dashboard binnacle houses four dials, consisting of a speedometer, range gauge, regenerative brake indicator and a needle which simply indicates whether it's replenishing or taking energy from the battery. In the centre is a digital screen, which notifies you of your current range and battery life.

Firing up is simply a case of turning the key two stages, and waiting until the blue-lit dials spring into life. Then you select 'D' on the dash-mounted switch, disengage the mechanical handbrake, and stealthily begin your journey.

Unlike some electric trucks I've driven, the FL Electric really is extremely quiet inside the cab. There's very little creaking of suspension components and whirring of power steering motors to break the silence, and the interior is rattle-free. Good build quality is essential for electric trucks, as they'll likely be on the road for far longer than their diesel equivalents, as owners attempt to recoup the initial purchase price by running them for up to 10 years.

In London, I began to wonder whether it was actually too quiet. While driving around the side streets, several people actually walked out in front of it. This happens in London all the time anyway, but its stealth-like qualities aggravated the problem. I took a few pigeons by surprise too!

As you'd expect, the truck is most at home in the urban environment, where the 2-speed 'box and instant torque combine to give smooth and impressively quick acceleration. With no vibrations or noises, I'd far sooner sit in a traffic jam in this than any ICE vehicle. It's just such a relaxed and peaceful place to be.

In other electric trucks I've driven, you operate the regenerative braking with the repurposed engine brake lever. By engaging it in stages you can determine how quickly you slow down, effectively doing away with the need for the service brakes. But it's different in the FL Electric, which has had the lever deleted. Instead there's a button on the dashboard, which when engaged, allows power to be put back into the battery via the footbrake. The harder you press, the greater the level of regeneration.

Much of my journey took me on the motorway, where the truck performed far better than I was expecting. With the cruise control set at 53mph it felt perfectly at home. It's well planted too, helped by the low centre of gravity from the batteries it carries.

While the battery gauge appears to be 100% reliable, I soon learned not to rely too heavily on the predicted range display. It appears to make its prediction based on immediate driving conditions, rather than taking a longer journey average. Consequently if you climb a short hill the range can drop by 20 or 30 miles. In the future electric trucks will no doubt be able to calculate a more precise predicted range for a pre-planned route, using GPS-based topography data, vehicle weight, traffic and weather conditions.

TECH SPEC

Model:	Volvo FL Electric 4x2
Cab type:	Comfort Cab
Motor:	Single electric motor 200kW
Traction batteries:	4, total 265kWh
Vehicle batteries:	2 x 170Ah 24V
Transmission:	2-speed I-Shift
GCW:	16.7 tonnes
Range:	140 miles
Body:	Lawrence David bonded box

Second on the list is a significant extension to the current achievable ranges. The distance between Blackpool and London is 250 miles, but the FL Electric has a claimed range of 140 miles (in actual fact I managed well over 150 miles between charges in this unladen truck), which meant a scheduled stop for recharging half way.

Now don't get me wrong, 140 miles is perfectly respectable for an urban distribution truck like this, which is likely to return to base each night. But think how many batteries you'd need in a long-haul tractor to get a half decent range. What we need is a breakthrough in battery technology, and quickly too. It's interesting to note that at the start of the last century, there were numerous electric trucks in production. In fact there was a Betamax/VHS-type of battle going on between electric and internal combustion engines (ICE). Just think how far advanced battery technology would be today if ICE hadn't won!

Next up is affordability. Electric trucks are eye-wateringly expensive, which acts as a massive barrier to hauliers looking to make the switch. A truck like this costs roughly three times as much as an ICE equivalent. How many hauliers can afford that level of investment? Instead what will happen is the big players will buy a handful, and of course shout about their green credentials to anyone who will listen, while their diesel fleet does the hard graft. There is no doubt that the price of electric trucks will fall in the future, but definitely not to ICE levels. The expensive bit is the batteries, and these aren't really affected by economies of scale, as they are packed full of the same precious metals that the whole world is currently demanding.

This leads me neatly onto the fourth thing on the list – incentives. The experts tell me that a cost parity with diesel is coming, and is arguably already here with refuse collection vehicles. But it's a long way down the line for long-haul. One way this could change overnight is with the introduction of decent financial incentives. So what are the current UK incentives? Well, for starters there's that warm fuzzy feeling some might get from the knowledge that they're supposedly doing their bit to help halt global warming. And of course there's the marketing opportunities associated with applying a "look how green I am" livery to your truck. Then of course there's the potential extra business you'll win from customers wanting their goods to be moved by a green truck.

All 2- and 3-axle rigid electric trucks are allowed to carry an additional tonne (or 700kg in the case of this 16-tonner on account of the axle weights). Up until 2025 all electric vehicles are exempt from London's Congestion Charging Scheme, and they're road tax-exempt too. There is also a small electric truck grant, but it's complicated and paltry compared with those offered by some other European countries. A deeper funded incentive scheme would boost the demand for electric trucks overnight.

And now for the big one.... infrastructure! According to the Society of Motor Manufacturers and Traders (SMMT) the UK needs 2,450 electric truck charging points by 2025 and 8,200 by 2030. On my drive to London I initially attempted to charge up at a motorway service area (MSA), only to find that while there's provision to charge cars, it doesn't have any truck chargers. And it's not alone. In fact at the time of writing there isn't a single charger in any of the UK's 111 MSAs. Of course I could have taken up three car charging bays, but instead I did the courteous thing and made a detour to a Volvo dealership. There it took 3 hours to fully charge the truck on a 50kW charger. Incidentally, a typical MSA today has a 1MW connection, but according to British utility company the National Grid, they will need 20MW to charge electric trucks – which is the same as a mid-size town!

Last but by no means least is green electricity. I make a point of referring to battery electric vehicles as "zero-tailpipe-emission" vehicles, because unless they're charged with green electricity they're not zero emission. Less than half of the electricity produced in the UK currently comes from renewables. Clearly your electric truck isn't as green as you think it is when fossil fuels are being burned to produce the electricity that charges it.

It's no wonder that sales of electric HGVs in the UK are estimated to be 14 years behind those of cars. And unless the points mentioned here are tackled, I don't envisage an explosion in sales any time soon. □

NEED TO KNOW

The SMMT suggests the UK will need 2,450 electric truck charging points by 2025, with 8,200 by 2030. But to our knowledge, none of the UK's 111 MSAs currently offers one

FOX ON THE RUN

OPERATOR OPINION:

PAUL FOX, CEO FOX GROUP

Having put the UK's first battery-powered tippers on the road, Fox Group CEO Paul Fox talked to us about the pros and cons of being an electric pioneer

WORDS: WILL SHIERS
PHOTOS: EXPO, FOX

Commercial Motor At last year's Road Transport Expo Fox Brothers took delivery of a pair of Volvo FE Electric 6x2 tippers. It was the first company in the UK to do so, and only the second in Europe. While the Blackpool-based family-run haulage and plant hire firm was already operating some electric plant, this was its first foray into electric trucks. After six months of real-world experience, Paul Fox, CEO of parent company Fox Group, admits to *Commercial Motor* that it has been a steep learning curve.

One surprise issue which manifested itself right at the start was ground clearance. "The batteries are low to the floor, so we have to be really careful where we use them," explains Fox. He says this limits access to certain sites, which causes headaches for planners.

A bigger issue has been the trucks' maximum range, which hasn't always lived up to his expectations. The tippers are required to do seven loads a day, within a 20-mile radius of its Leyland site, and were specified accordingly. While Fox says they can indeed do this on a single charge, the conditions need to be good. Throw some unfavourable variables into the mix, such as hilly terrain and adverse weather conditions, and the range is reduced. "Running 20 miles into the Ribble Valley burns a lot more juice than 20 miles to Southport," explains Fox. "And if it's raining, then the wipers, heater and lights all draw massively," he says.

Another obvious drawback to running electric trucks are their eye-watering upfront costs. These particular tippers had £330,000 price tags, so whether purchased outright, leased or contract hired, are considerably more expensive than equivalent diesel-powered trucks. What's more, being 6x2s, they don't have the same revenue earning potential as the 8x4s on the fleet. With this in mind, Fox thinks we're a long way off seeing a cost parity between battery-powered and diesel-powered trucks.

"If a business model was made around a fleet of these, it would not work. Not a chance!" he says. "But we're lucky enough to be in a position where the business can afford to do it."

Of course, the company was well aware of the economics before placing the order, the only surprise being the rising cost of electricity.

And now for Fox's biggest concern of all – charging. There were some initial issues surrounding the charging of these particular vehicles, but these were rectified with the help of supplying dealer Thomas Hardie Commercials. But what Fox is less impressed with is the National Grid.

Wanting to plan ahead, he's enquired about fitting four additional chargers at the Leyland site, enabling six electric trucks to be charged at once. However, for this to happen, he first needs to pay between £40,000 and £50,000 to upgrade the electricity supply. Initially he wanted to future-

WHY VOLVO?

"I think Volvo is a lot further ahead with electric technology than other manufacturers," reckons Fox. "Scania is on the way, but is massively out on cost at the moment. So, unless we have some sort of disaster, we will focus on Volvo for the foreseeable future."

Also swaying him towards Volvo is Fox Group's strong relationship with dealer Thomas Hardie Commercials, in particular customer solutions manager Neil Crook. "If we have a problem at 5am I'll ring him, and he'll answer. He's a great guy and I have a lot of time for him," he explains.

Fox anticipates keeping these two electric tippers on the fleet for three years, before swapping them for new ones. "By then the technology will have moved on further again," he says.

proof the site with 20 chargers, but was told that this wasn't even possible at the moment. "We run almost 350 trucks, and at a weekend we have about 160 wagons at Leyland. Just imagine trying to charge that lot."

Not only has Fox discovered that the UK charging infrastructure isn't currently ready, but he has serious doubts whether it will be ready in the next decade. He believes that there's a huge disconnect between what he's reading in the press and watching on TV, and what's happening in the real world.

"People don't know how far behind the infrastructure is. Not only are we talking about different pages of the book, but totally different chapters too," he warns. "We have over 300 trucks on the road. It would be a mammoth task to electrify them all, and I can't see it happening within the next 10 years. There's more chance of me winning the lottery three times in a row!"

LOOK ON THE BRIGHT SIDE

The electric tippers have brought some definite pros to the business too, not least the environmental benefits.

Thomas Hardie's Neil Crook (left) hands over the keys of the UK's first electric tipper to Paul Fox

The Fox Group is on a drive towards carbon net zero, and in recent years has made a number of green investments. Its depots are in the process of having solar panels on their roofs, and it operates electric plant too. There are also regular meetings with carbon net zero consultants, as recommended by the local Chambers of Commerce.

"But if someone tells you that they're buying electric trucks purely for that [environmental] reason, then they're hypocrites," he declares. "Yes, it's good to be doing something for the environment and the community, and it's great to be heading in the right direction, but the main drivers are positive publicity and your CSR (Corporate Social Responsibility) and ESG (environmental, social and governance) scores."

Fox says not only has the company received a lot of positive publicity since putting the trucks on the road, but its CSR score has been boosted. "And from an ESG point of view, they're gold dust," he adds.

Their arrival on the fleet shows that the Fox Group is taking the environment seriously, and is ahead of the curve. This hasn't gone unnoticed by some of the UK's largest contractors, who are eager to have the electric trucks on site, allowing them to tick a box in their own carbon net zero policies. "We've learned that there is a drive within the construction industry [for carbon net zero], especially amongst tier one and tier two contractors, and it's started to fall into the tendering process," he explains.

So, having weighed up the pros and cons, does Fox regret being an electric truck pioneer?

"Absolutely not! We are fully committed to electric vehicles," he confirms.

In fact, he has already placed an order for two Volvo FMX Electric 8x4 Tridem tippers, which at the time of writing are close to being delivered. One of them will feature the UK's first fossil-free steel chassis.

He adds: "There's a lot of hype surrounding the arrival of electric vehicles. Well they're not coming…they're already here. You can see it in the car industry, and wagons is a natural progression. You have to embrace it and take the jump. Unless somebody takes a leap of faith, then nobody will. It's a learning curve. It's the first step on a very long ladder." □

COMPANY HISTORY

Fox Brothers was founded in 1932 by current CEO Paul Fox's great grandfather Jack Fox and his brother. They started out with a tipper and a coach, but gradually moved into tippers, vehicle hire and earthworks contracting.

In the 1940s, Jack's son Harold, known as Barney (Paul's grandfather), started working with his father.

"My grandfather had three sons and a daughter, his daughter being my mother," explains Fox. Barney passed away in 2007, at which point ownership of Fox Brothers passed to fourth generation family member Paul Fox.

"My grandfather brought me up, and the business wouldn't be what it is now if it wasn't for what I learned off him, and most days I think 'what would he do?'" says Fox.

Over the past few years, the company has been on a major acquisition trail, including Hurt (Plant Hire) in 2020, JJ O'Grady in 2021, Blackledge Plant Hire, Woods Waste and Cotswold Roller Hire in 2022 and Stockport-based Tipworx earlier this year.

Today the Blackpool-based family-run firm operates from 30 locations, and has a combined fleet well in excess of 300 trucks and 4,500 pieces of plant and machinery.

NEED TO KNOW

Fox Group operates over 30 locations, and has a combined fleet of 300 trucks and 4,500 pieces of plant and machinery

RISE ABOVE THE REST

VOLVO: FM ELECTRIC 4X2 TRACTOR

When Nationwide Platforms felt ready for its first electric vehicles, Volvo's solid products and data-driven approach won the deal

WORDS: BRETT WEIR
PHOTOS: CRAIG ECCLESTON

Commercial Motor Electromobility continues to sweep its way through the commercial vehicle sector. Despite the tried and tested performance and reliability seen in traditional diesel models, there's no denying that if the industry is to significantly reduce its environmental impact, a move to greener powertrain technology is vital. Making the switch is far easier said than done though, with plenty of practical variables for all stakeholders to consider.

The upfront entry price may be daunting for many fleet operators, despite the long-term cost savings electric models can yield. Other complications include deciding how best to install and implement charging infrastructure and how to plan a charging routine that balances the best of range and power availability.

In addition, will drivers and staff need to be reskilled? What does the future hold for diesel models already on fleet? What array of red tape and legislative hoops will governments and local authorities require them to navigate? There's plenty to keep transport managers up at night.

For those at the other end of the industry supply chain – the manufacturers – there are equally pertinent and worrisome questions. Perhaps the biggest hurdle they face is convincing their customers that their brand-new electric models are capable of matching the driving and operational performance of their diesel counterparts and ultimately exceeding them. Not only will they be required to do this within the current comfort zone of electric vehicles – low-range urban logistics – but also increasingly across longer ranges, while hauling far heavier payloads.

NEED TO KNOW

To deliver the necessary driving performance, the FM Electrics both feature three electrical motors, generating an output of 666hp and 2,400Nm of continuous torque

FITTING INTO THE FLEET

Customers are increasingly placing their faith in manufacturers to deliver on these metrics, however, with Nationwide Platforms an excellent case in point. Earlier this year, the company took delivery of two new Volvo FM Electric 4x2 tractor units, in what is believed to be a first-of-its-kind deal for its sector in the UK.

Supplied by Rory Kelly, transport solutions executive at Volvo Truck and Bus Centre South & East's Coventry depot, the FM Electrics have to perform in the customer's fleet. As the UK's leader for powered access solutions, the company's bread and butter lies in its ability to quickly supply a diverse range of heavy and sophisticated lifts, pickers and telehandlers across the country.

This setup requires an efficient and reliable vehicle fleet, capable of hauling a mixture of heavy loads quickly and safely. Therefore, the electric trucks must not only bring the necessary driving range to allow Nationwide Platforms to make multiple plant hire deliveries and collections every day, but also have sufficient battery power to ensure these transactions are completed efficiently and effectively in ample time.

"We need the electric trucks to cover up to 150 miles each day on the routes they'll be working, while also providing enough power to drive our ancillary equipment," stresses James Clarke, Nationwide Platforms' haulage and logistics director. "They've been spec'd to deliver that and more, with a comfortable margin of power in reserve at the end of the day before recharging in our depots overnight. We are confident they will slip into our operation seamlessly, while also turning heads out on the road."

Settling on its final specification was no quick task though, with Clarke adamant that any electric trucks the company welcomed into the fleet arrived not just as a publicity stunt but as very capable performers. To ensure they hit the mark, Nationwide Platforms and Volvo Trucks worked closely together across several months, taking a thorough look at where and how electric trucks could work for the customer.

DATA ANALYSIS

The first step saw Volvo's team analyse data generated by Nationwide Platforms' existing fleet to help understand the exact requirements and unique challenges its vehicles face day to day, quickly concluding electromobility could meet these needs.

"Our route planning and simulation tool is an invaluable bit of kit in today's market to show how capable our current electric models are in some tough operating domains," explains Kelly. "To help James and his team narrow down on a spec, we were able to take underlying Nationwide Platforms' data, choose a route, input a few drop locations and hit the virtual road. That allowed us to easily see not just how the truck performed, but also how its usage and specification could be refined to ensure we delivered the ideal electric vehicle."

Volvo's simulation sees a virtual truck 'loaded' with a variety of different weights and tasked with tackling a

mixture of routes through various towns and cities. The tool allows users to input several variables into the equation, factoring in metrics including multi-drop deliveries, charging point availability, the topography of the road and even typical ambient temperatures to create a detailed summary of the feasibility of the route in question.

That process was crucial for settling on a final specification for Nationwide Platforms. For instance, having originally considered an 8x4 rigid, the simulations showed a 4x2 tractor unit was a more suitable option for the work at hand. Volvo and Nationwide Platforms also concluded that there was an opportunity to reduce the number of batteries, settling on five rather than six. That decision allowed the FM Electrics' respective payloads to be maximised with the assurance that they would still produce plenty of range and power.

CONTROLLED PERFORMANCE

To deliver the necessary driving performance, the FM Electrics both feature three electrical motors, generating an output of 666hp and 2,400Nm of continuous torque, paired with a standard I-Shift gearbox to deliver a smooth and ultra-quiet in-cab driving experience.

This impressive performance is handled by an electromobility traction control system that helps manage power output on slippery surfaces, while different drive modes are available to set the desired performance, comfort, and energy usage levels.

As for the vehicles' chosen depots, the decision was made during the analysing process to base one at Nationwide Platforms' Birmingham site and the other at Warrington. This will not only help to further drive down Nationwide's fleet emissions and meet existing and upcoming clean air zone regulations in both regions, but the initial simulations also concluded that the typical delivery schedules from these two sites fall comfortably within the available range of their chosen truck specification.

It was not just the product itself that was key to Volvo winning the business, however. Overall, it was the manufacturer's ability to secure a complete offering, delivering not just the vehicles themselves but a holistic solution encompassing maintenance, financing solutions and more.

TECHNICAL SPECIFICATION

Model:	Volvo FM Electric 4x2 tractor
Cab:	Globetrotter cab
Battery Capacity:	450kWh via five batteries
Charging time:	9.5h with AC (43kW), 2.5h with DC (250kW)
Driveline:	Three electric motors
Transmission:	Standard I-Shift gearbox
Performance:	Up to 666hp and 2,400Nm of continuous torque

In this instance, the FM Electrics are backed by comprehensive five-year Volvo Gold Contracts to guarantee maximum uptime, including preventive maintenance and repairs, plus the monitoring of key systems such as batteries and other critical components.

Customers can continue to benefit from Volvo's data-driven approach to fleet analysis post-delivery with access to its Range & Route planning and simulation tool, which is enabled via Volvo Connect. This allows Nationwide Platforms to input the two vehicles' expected workloads for the upcoming day into the simulation before leaving their depots to see whether they are capable of completing their designated routes successfully, as well as helping to optimise their usage.

The need to deliver a complete package also extends into the cab. The switch to electromobility has the potential to affect vital interior features and technologies, with the batteries onboard required to power not just the vehicle's movement but also to supplement aspects including infotainment and assisted driving systems. However, Nationwide Platforms has not had to sacrifice creature comforts in the name of sustainability.

The FM Electrics have been fitted with spacious Globetrotter cabs and a Drive++ package, which adds dual armrests, leather upholstery and fully electronic air conditioning with sun, mist and air quality sensors and a carbon filter – ensuring premium driver comfort.

Visibility is improved with v-shaped LED headlamps that automatically adapt to ambient light conditions, and rain-sensing windscreen wipers to ensure a clear view of the road ahead. Also included in the specification is a host of active safety systems, including Lane Keeping Support, Lane Keeping Assist and Driver Alert Support, as well as Side Collision Avoidance Support on both the driver's and passenger's side to boost safety.

REASSURINGLY SUPPORTIVE

This level of support is increasingly becoming the required model for the sector. By taking a hands-on approach to the deal – working tirelessly before, during and after delivery to ensure any vehicles supplied can tackle the job at hand effectively without compromise – manufacturers such as Volvo stand the best chance of reassuring customers operating vehicles of all sizes and uses that electric technology is here to stay.

"Given the size of vehicles and equipment in the fleet, driving sustainability gains has always been easier said than done," says Clarke. "Products such as the FM Electric are clearly a step in the right direction for the environment. There is huge potential in transitioning, where possible, to low- and zero-tailpipe emission heavy trucks and this is a very important step for us.

"Sustainability is a key driver for the business, and introducing our first battery electric trucks is the right thing to do. Volvo had the product that met our sustainability commitments, and it's exciting to welcome these new electric models." □

Rory Kelly - transport solutions executive at Volvo Truck and Bus Centre South & East, Richard Riley - electromobility sales development manager at Volvo Trucks, Christian Coolsaet - MD Volvo Trucks UK, Paul Rankin - Nationwide Platforms COO, James Clarke - Nationwide Platforms logistics director and Glyn Brearly - Nationwide Platforms procurement director

VERSATILE VOLVO

Nationwide Platform's two new electric tractor units are split between its Birmingham and Warrington depots.

The Volvo FM Electric is a versatile truck for heavy local transport and regional distribution.

Nationwide Platform's two new electric-tractor units are trailers to transport split between its Birmingham and Warrington depots.

The trucks are being used to pull step frame trailers transporting hire equipment to and from sites around Birmingham and the north west.

Both trucks are fully backed by Volvo and are covered by five-year Volvo Gold Contracts.

Established in 1994, Nationwide Platforms is the UK's market leader in powered access hire equipment, with more than 1,000 employees servicing 31 depots across the country.

TRUCK IN SERVICE

VOLVO: **FM42T E NEW FM ELECTRIC 4X2**

This new electric version of the FM doesn't look a lot different to the diesel- or gas-powered versions at first glance, but the main talking point comes when you power it up and listen to the the noise it makes — or rather the lack of it

WORDS: BOB BEECH
PHOTOS: TOM CUNNINGHAM

Commercial Motor Monday 29 January 2023 was one of those rare days that will stay with this writer for the rest of time, as it was one of those unique occasions on which we got to do something truly different. It was the day when we first coupled a fully electric Volvo FM 4x2 up to a loaded trailer and went off to make a delivery and collect another load, which was a truly novel experience.

Once again, we were trusted by the team at Volvo Trucks Great Britain to be the first from the transport press to use one of its fully electric demonstrator vehicles in a proper revenue-earning operation, without anyone from the manufacturer overseeing us. The first time was back in late 2021, when we were lucky enough to be handed the keys and charging lead to a brand-new Volvo FL Electric 16-tonne rigid with a box body and tail-lift. We used the truck for local delivery and collection work and were impressed with the technology/engineering and overall performance.

This left us keen to try one of the bigger models from the all-electric range – preferably a tractor

unit – as soon as they became available. Martin Tomlinson, UK head of media and truck demonstration at the truck manufacturer, was as good as his word and sent the fully charged FM to us as soon as possible. As before, we were able to use the AC 43kW three-phase charging points that are normally used to power the electric standby operation for temperature-controlled trailers in Broughton Transport's depot.

The overall rate of charge is far lower from the 43kW AC charging system, but it was still possible to bring the FM batteries back to full health from just 10% capacity in 8-9 hours. Higher-rated DC charging points will replenish the batteries far faster. With up to 250kW capacity, they will completely recharge the system in about 2 hours, but up to 80% of capacity can be achieved in around 1.5 hours. This makes it possible to replenish up to 50% of the truck's total battery capacity in a 45-minute period, dovetailing nicely in with a driver's statutory break, subject to there being suitable facilities at multiple locations.

VEHICLE SNAPSHOT

"There is no conventional clutch because drive does not have to be broken to bring the vehicle to a standstill – the motors just reduce their rotational speed to zero"

VEHICLE SNAPSHOT

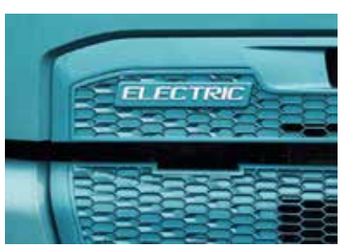
This was more than enough for what we intended to do with the FM. The potential range, recharging time and the availability of suitable charging points are some of the key issues for operators considering a move to electric power, and we will return to this point later. Our intention with this early look at electric power for heavy truck operation was to find out how it performs on the road, and to discover whether they are a real alternative to diesel power for certain applications.

Obviously, the predicted battery range of around 200 miles for the FM tractor unit limited exactly what we could do with the truck. Fortunately, the haulier has quite a wide-ranging operation and we were able to keep the truck busy on a mixture of pallet network deliveries and collections, interspersed with short movements within the local area for a range of customers.

Battery electric vehicle technology is constantly evolving. Power density and vehicle range are very much a moving target, and all manufacturers have made considerable strides in technical developments. At present, a tractor unit with this relatively short range compared with a diesel equivalent has limited appeal in the market, but Volvo is predicting considerable gains in available range, along with other technical advances. Those that say they are bound to make these claims should bear in mind that the product we were testing is now in series production, as are almost all the other models in the Volvo electric range. Also, these designs have been developed in a remarkably

DRIVING THE VOLVO ELECTRIC FM

Many would probably be a little wary of jumping straight into a fully electric truck and heading off to do a day's work, but fortunately we have had



a fair bit of experience of the all-electric Volvo from press events and our week with the FL. That said, there is very little to be concerned about, and it's simplicity itself once the key has been turned and the drive system activated. There is a slight whine as the compressor kicks into life, but this dies off as soon as the tank pressure is restored to its pre-set levels. Otherwise select drive, press the throttle pedal gently, and the electronic handbrake releases and the truck starts to move, virtually silently and with a gentle take-up of drive.

It is possible to modulate low-speed drive perfectly via the pedal, even when starting fully laden on a gradient. All the relevant controls, such as the hill hold, work as with a normal FM, and the traction is excellent. Also, the absence of noise plays an important part in this experience. When coupling up to a trailer, the electric drive system used in conjunction with the air-suspension makes it a silky smooth process. Also, you don't only hear the audible click of the fifth wheel jaws locking, but it's also possible to hear the twang of the return spring pulling the handle into the locked position.

As previously mentioned, acceleration is rapid from a standstill, which can surprise other road users. Car drivers anticipating being held up by a heavy vehicle are visibly shocked by just how quickly the Electric FM gets up to speed. It would easily beat the most powerful of diesel engines over the first few hundred yards. Starting in seventh gear means that it makes at least two less gear changes to get to 20mph-plus, and the instant power and torque delivery of the electric drivetrain enables the FM to keep gaining ground.

PULLING ITS WEIGHT

On the steepest of hills at 40 tonnes it does start to lose speed as the weight and gradient start to make themselves felt and the gearbox downshifts accordingly. An FH16 750 would catch it if the hill was long enough, but the Electric FM would be right behind it as soon as the gradient reduced.

The regeneration function is interesting. As mentioned, it will handle almost all of the braking. Even on steep gradients at 40 tonnes, we found that it is best to apply it just before the crest of a downgrade, and let it slow the truck accordingly, then ease off slightly and use it to regulate the speed accordingly. The more weight it has to contend with, the better it works and the more power that is returned to the batteries. One reasonably long hill of about 12% put an additional 3% of power back into the system. We would like to try it on some of the really long descents in Europe. We found that the best way to drive the truck on urban roads is to accelerate out of roundabouts reasonably quickly, then lift off, turn the regen function off, and let the truck coast. Then, at a sensible distance from the next roundabout or bend, slow the truck gradually using the regen system. It becomes second nature after a while, and it is possible to keep up a decent speed without having to brake sharply.

The whole process is relaxing, with the silence really adding to this effect. There is just a slight hum under acceleration and the odd gentle squeak from the suspension bushes, and there is a distant sound from the gearbox as it selects the next ratio. However, there is no driveline shunt or torque transfer whatsoever. The ride and handling are superb, with just enough roll to keep you informed on how fast you are going. The Volvo Dynamic steering is a delight to use, and seems perfectly in keeping with the sophisticated power delivery.

One surprising feature we noticed was that at blind bends and junctions with restricted vision, dropping the window a

fraction enables you to hear if any other traffic is approaching. Also, the silence makes you far more aware of the presence of other traffic in urban areas. It highlights that empty curtainsider trailers actually make quite a lot of noise on poor surfaces. The modern design of the FM with its excellent vision and superb mirrors, coupled with a very familiar control layout, make the truck an ideal fit for city centres and heavy traffic, which is the sector that it is predominately aimed at.

SPECIFICATION TABLE

Manufacturer	Volvo Group
Model	FM42T E New FM Battery Electric 4x2 tractor unit with full air-suspension and Globetrotter high-roof sleeper cab
First registered	1 January 2023
Chassis	3,900mm wheelbase. Plated GVW 19,000kg (design GVW 20,500kg). Plated GCW 40,000kg (design GCW 44,000kg). Full air-suspension front/rear. Front axle plated/design 8,500kg. Rear axle plated/design 12,000kg. 385/55R22.5 tyres front, 315/70R22.5 rear. Alcoa Dura-Bright polished aluminium wheels all round. Volvo Dynamic Steering with personal settings and stability assist. Volvo sideskirts, catwalk with folding steps. 6x 90kWh lithium-ion (NCA) battery packs giving a total of 540kW power capacity. Main traction batteries mounted on either side of chassis between the axles, plug-in charging point on offside. Conventional 24V batteries mounted in rear of chassis for conventional electric supply system. Fixed fifth wheel, coupling light, three-piece rear wings.
Drive system	Triple electric motors giving 490kW (666hp) continuous power output/2,400Nm continuous torque output, regardless of electric motor rpm. Drive is taken directly through a Volvo I-Shift 12-speed automated manual gearbox. Conventional type cooling system utilising a radiator, coolant, water pump and associated hardware. This both cools the batteries and provides cab heating and ventilation. Electrically driven power steering system, air compressor and alternator for the 24V electrical system. Drive is then transmitted via a conventional propshaft to a single-reduction Volvo drive axle, with diff-lock and traction control system. Automated power regeneration system returns electric power under braking.
Brakes	EBS-controlled, air-operated disc brakes with ABS/ASR and Hill Hold, conventional air supply for trailer brakes and suspension. Safety systems include stability control, AEBS, lane guidance, adaptive cruise and smart cruise with distance control.
Cab	FM Globetrotter high-roof sleeper cab, with four-point air-suspension, electro-hydraulic cab tilt with manual override. Twin external lockers, external sun visor, fog and additional driving lights, full deflector kit. Interior: plush leather trim with heated and cooled driver's seat, under-bunk and overhead storage, single bunk with comfort mattress, fridge, automatic temperature control, night heater and integrated night cooler. Volvo infotainment system with DAB radio, navigation and media, driver information system, interactive dash, separate touchscreen controls with numerous features including vehicle telemetry display
Unladen weight	10,400kg.

short timeframe, less than six years in most cases, which is astonishing in terms of industry norms for new technology. Put simply, it took almost three decades to get automated manual transmission systems for diesel-powered trucks to the level that we have today. Volvo's much-vaunted I-Shift is a good example of this. Compare an original version from the early 2000s with a current version and see the difference in technology, sophistication and refinement, never mind trying an original Geartronic automated manual from 10 years before.

LAYOUT AND SPECIFICATION

The current diesel- or gas-powered FM range will be familiar to almost every reader. It represents the latest version of a well-proven and diverse range, meeting a wide range of applications. This new electric version does not look a lot different at first glance. It's just a well-specified 4x2 tractor with the taller Globetrotter cab options and a smart set of chassis side skirts. Remove the bespoke Electric graphics and badges and few would give it a second glance. That is until you turn on the ignition key. The absence of engine noise and associated mechanical interaction is what really grabs the attention of almost everyone in the vicinity. Members of the public everywhere were fascinated by the Electric FM, with people coming out of warehouses, factories and offices to ask about it and take the obligatory photos. Directors of companies – those that drive electric cars in particular – wanted to know all about it, and more than a few organisations posted on social media to demonstrate to their own customers how they are reducing their carbon footprint, if only for an hour or two!

The 4x2 layout has a 3,900mm wheelbase with full air-suspension to create as much space as possible for the battery packs, which are mounted outboard of the standard medium-height Volvo chassis. They comprise six individual packs, but other axle configurations may have five packs depending upon chassis layout. Each individual pack of lithium-ion batteries has a capacity of 90kWh, giving a total of 540kWh. As with mobile phones, some 15% at either end of the total capacity is not utilised, which preserves long-term battery life. This total usable power with the electric FM is set at 70% of 540kWh, which translates to 378kWh capacity when the batteries are recharged from a mains power point. The rate of charge is reduced to protect the individual battery cells when they reach 80% of the available capacity, which gives an even distribution of electric power throughout each cell.

NEED TO KNOW

Whilst the truck looks relatively conventional from the outside, tilting the cab exposes a whole new world of vehicle technology

MOTORING ALONG

The three electric motors drive through a conventional I-Shift 12-speed automated transmission. There is no conventional clutch because drive does not have to be broken to bring the vehicle to a standstill – the motors just reduce their rotational speed to zero. Each motor is mounted on an adapter plate, which enables them to transmit power directly to the input shaft of the gearbox. The gearbox is mounted further back in the chassis than with a diesel engine, and drive is taken via a conventional propshaft to a single-reduction Volvo drive axle with a diff-lock and a sophisticated traction control system. This bespoke system has been specially devised to ensure traction on loose/slippery surfaces. The torque characteristics of electric drive systems mean that the full 2,400Nm output is

developed as soon as the motors turn, and remains constant regardless of the speed of the electric motors.

Once on the move, the I-Shift transmission (as with diesel or gas power) chooses the ratios suitable for the situation. However, it picks a far higher starting gear, usually sixth or seventh at 40 tonnes, then makes just two changes to get to 12th. This ensures rapid acceleration, enabling the laden FM to more than keep pace with traffic flows in urban areas. The driver can override the transmission by use of manual mode, but there is little to be gained in most situations, the control system being that sensitive. The other aspect of electric traction that is particularly relevant to heavy vehicles is that the electric motors can be turned into generators to return electric power to the batteries under braking. This is controlled by what would normally be the engine brake control stalk in a diesel FM. It allows two stages of regeneration/retardation: the first stage activating the system when the footbrake is applied; the second stage bringing in the system straight away. The available braking power is akin to that of a powerful retarder, and it's possible to use the system for almost all of the on-road braking. It's also possible to see just how much power is being returned to the batteries via the dash display. A long hill descended at full weight means that there is more available battery power at the bottom than there was available at the top.

LOOKS CAN BE DECEPTIVE

Whilst the truck looks relatively conventional from the outside, tilting the cab exposes a whole new world of vehicle technology. Many might think there would be a huge void that would otherwise be filled with an 11- or 13-litre diesel. In fact, there is a bulky mass of control systems, ancillary equipment drive systems and even a conventional radiator, along with the power steering system, compressor, alternator for the conventional 24V electrical system, water circulation system which both cools the batteries and heats the cab, and the air-compressor system for the suspension and brakes. These functions are all electrically driven. These components are reasonably familiar, but the rest of the technology obviously requires specialist attention. The high-voltage cables are marked in orange and need to be fully isolated before maintenance work can be undertaken.

The FM Globetrotter cab on this truck was specified to a high level, which obviously increases the capital cost somewhat. But rest assured, reducing the equipment levels would not make a huge impact on the overall cost of any electrically powered heavy truck. Our truck had cab air suspension, full leather trim, fridge, automatic climate control, auxiliary heating and cooling, full infotainment system, interactive dash and auxiliary touchscreen. It even had the familiar I-Shift control next to the driver's seat.

OPERATING FACTORS

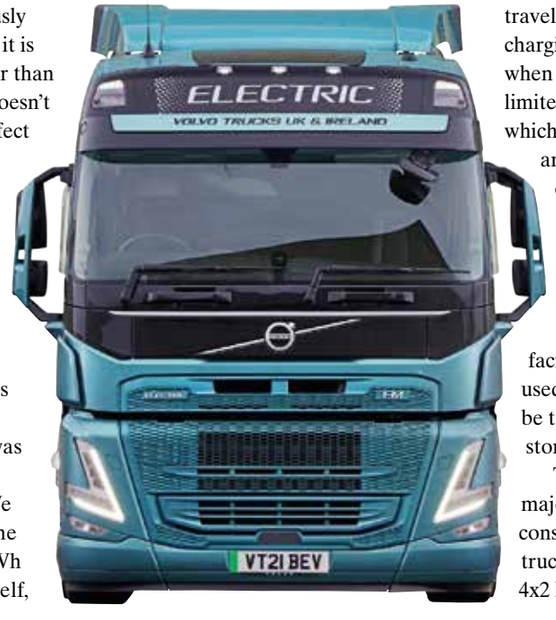
We found Volvo's prediction of a range in the region of 300km (200 miles) to be reasonably accurate. Obviously the truck uses less power when it is cruising at a steady speed rather than stopping and starting. Weight doesn't seem to have quite the same effect upon consumption as it does with a diesel. It obviously uses more power to get moving, but if the driver is gentle on the throttle and uses the regen function to good effect, there is not a massive difference in the rate of power consumption between 25 tonnes and 40 tonnes gross. Also, one factor that really surprised us was the amount of power created by the regeneration system. We used a total of 898kWh over the week, but a remarkable 196kWh was generated by the truck itself, which was in effect free fuel.

VEHICLE SNAPSHOT

"The absence of any engine noise and the associated mechanical interaction is what really grabs the attention of almost everyone in the truck's vicinity"

VEHICLE SNAPSHOT

The highest daily mileage we recorded was just over 230km. We were grossing 30 tonnes on a trip over the Gloucestershire border into the Cotswolds, then empty back to the Swindon area, before reloading to 35 tonnes and heading back to base. This was followed by a local job, where we were fully loaded in both directions. The battery gauge showed 97% when we started and 31% remained at the end, so we used a total of 66% of the available power. Without access to rapid charging facilities to top up the power levels during a break, this is not enough for most rural distribution operations, but it would suffice for many city operations, particularly at night. Volvo predicts a steady increase in battery capacity and projected range over time. It is confident that the range can be increased by as much as 50% in the next few years, and more again going forward. Considering that battery range capacity has more than doubled for heavy BEVs in the last couple of years, we see little reason to doubt these predictions.



CHARGING ISSUES

Charging access points, both at base and out on the road, are a key issue, as is the price paid for electricity. One of the main problems in the UK is the lack of electrical power generation within the grid. Quite simply, we need a huge expansion in every acceptable form of power generation to make it possible to expand the use of electric vehicles and provide power for heat, light and every other user of electricity. This is a question beyond the scope of motor manufacturers and the transport industry to answer. Politicians must face reality. The automotive industry is developing the vehicles that politicians and environmentalists have demanded, but it is now time to be realistic about what can be achieved.

From an operator's perspective, the two most important factors will be the availability and cost of electricity. Knowing where the vehicles will be travelling and being in range of suitable charging points are especially important when battery range is still relatively limited. Double-shifted operations, which vehicles regularly return to base, are an obvious application, and operators that have the ability to supplement mains electricity supply with solar and wind generation will have a distinct advantage. The ideal situation would be to have a battery storage facility from which power could be used to recharge vehicles. It would be the equivalent of having a bulk storage tank full of cheap diesel.

Two other factors that remain major hurdles for operators considering the use of electric heavy trucks are weight and cost. This 4x2 FM Electric weighed 10,400kg,

according to the integral weighing system, which utilises the truck's air-suspension. This was split at 6,600kg on the front axle and 3,800kg on the rear as a solo tractor unit, which is in the region of 3,000kg more than a diesel version. The regulations allow a modest uplift in gross weight for electric vehicles, but not enough to offset the additional weight significantly. Also, it is very easy to overload the drive axle with anything less than an evenly distributed load on the trailer. For most operators, a 6x2 tractor unit is the obvious choice, but it would be a tag-axle layout with a similar wheelbase to this 4x2, making for a long tractor unit that would require an exemption to pull a full-length 13.6m trailer. We also think that it would be wise to specify a hydraulically steered tag axle to improve manoeuvrability and reduce tyre scrub. Obviously, this layout would increase unladen weight further still. The first tag-axle FM Electric tractor came in at 12,140kg, again quite a lot more than a diesel- or gas-powered equivalent.

Cost is another big hurdle. This 4x2 tractor has a price tag in excess of £325,000, which is about three times more than a diesel equivalent. This additional cost would be a huge barrier for many considering outright purchase.

NEED TO KNOW

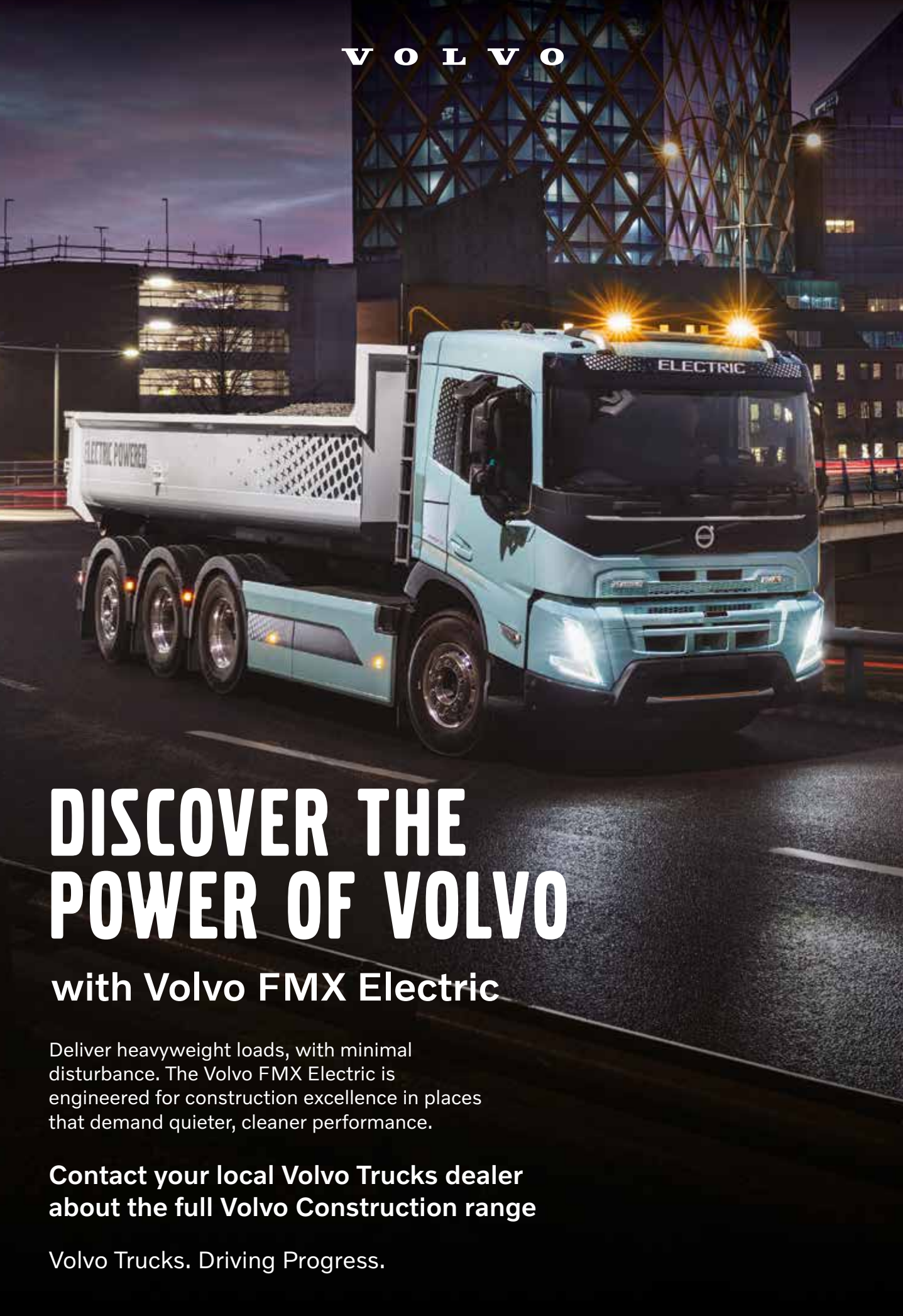
The potential range, recharging time and the availability of suitable charging points are some of the key issues for operators considering a move to electric power

Leasing is probably a better option, but it requires either the manufacturer or leasing company to take a bold view on the likely residual value to make this affordable. Car manufacturers are able to spread the development cost of electric drivelines over a far greater number of vehicles sold. Truck manufacturers would be lucky to reach large production numbers in the next few years, so the front-end price will almost certainly remain high. We think the way forward is for an electric heavy truck to be carefully specified to meet the exact needs of the first owner and kept in operation for maybe eight years or more.

Battery life is projected to be eight or nine years, but even then it would almost certainly suffer a gradual decline in capacity. If this could be extended with a full or even partial refurbishment of the battery packs and associated hardware, all bound up in an ongoing lease and maintenance contract, the high initial capital cost would be far less of a burden. More importantly, operators taking on electric heavy trucks should be granted tax breaks and financial assistance from government to ease the financial burden. Whether this will happen is impossible to tell, but without this help the politicians will not meet their lofty aims in terms of decarbonisation. □

CONCLUSION

The FM Electric is an impressive piece of technology, and the engineering and technical sophistication are quite remarkable. We knew it would work well, but it far exceeded our expectations. The technology works, and will improve still further, because the manufacturer has the resources and commitment to make it happen. Electric vehicles will be part of the future, but not the only source of power. They excel in certain applications, but are not the best choice for other transport tasks. The world needs to give operators a choice of propulsion systems going forward, and forcing the transport industry down one single route will not work. However, a mix-and-match approach certainly will.



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