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COP26



David Wells

Chief Executive, Logistics UK



Welcome

The 2021 United Nations Climate Change Conference, commonly known as COP26, is the 26th in the series. It is also the event that represents the UK government's best chance of setting the global agenda for tackling climate change.

The decarbonisation of transport and drive towards zero-emission vehicles is a key focus of this year's conference. According to COP26's own research, road transport accounts for 10% of global emissions, which are rising faster than those of any other sector.

The logistics sector has a crucial role to play in this drive to decarbonise, and our members have shown themselves keen to support global environmental initiatives wherever possible. That is why I am delighted to be hosting a virtual event on 10 November 2021 – Transport Day at COP26 – which will see the launch of Logistics UK's ambitious new environmental manifesto.

In this *Logistics Magazine* supplement, Michelle Gardner, Logistics UK's Head of Public Policy and lead on decarbonisation, will set out the latest developments in phasing out the sale of conventional fossil fuel HGVs and vans, the infrastructure challenges ahead and the opportunities for freight carried by rail, air and water (see page 6).

We thought it important to include a range of views from industry and academia too, and took the opportunity to interview Professor Philip Greening, Deputy Director of the Centre for Sustainable Road Freight, for his take on the opportunities and challenges that lie ahead (see page 10).

Many of you are already taking your first steps to decarbonising your van fleet operations. On page 18, Ian Cameron, Head of Innovation at UK Power Networks, advises operators on installing and upgrading electric charging infrastructure at their depots.

As the UK government prepares to host the COP26 conference, the UK logistics sector must play its part in helping to support its climate change ambitions. I hope the content contained within this supplement will inspire you to seize the opportunity that this historic conference represents.

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SPONSOR'S MESSAGE



Matt Tolan

*Business Development
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The climate crisis is one of the biggest challenges facing the world today. In the UK, transport contributed 28% of UK domestic emissions in 2018 making it the largest contributor. It is therefore clear that the UK logistics industry will play a vital role in decarbonising the nation's economy.

The government's *Transport Decarbonisation Plan* set out its strategy of phasing out the sale of new non-zero emission HGVs up to 26 tonnes by 2035 and 2040 for those up to 44 tonnes as well as a 2030 phase out date for polluting cars and vans.

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The celebratory **Gala Dinner** is open to the whole industry. The evening promises to be a packed event full of conversation, networking and insights for leaders across the logistics sector. It's also a great opportunity to celebrate and reward your team, host clients and of course celebrate at an important industry event!

This year's awards ceremony will be hosted by one of Britain's brightest comedy talents **Ed Gamble**, a stand-up comedian, podcaster and radio presenter, who will also provide post dinner entertainment. The evening is an event not to be missed.

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FEATURE

The route to net zero for logistics

Driving forward the transition to zero emission transport is set to be a key focus at the upcoming UN Climate Change Conference (COP26), to be held in November 2021. While the shift to zero tailpipe emission vehicles is already underway – and many of Logistics UK’s members are already leaders in this space – the COP26 community is urging that this transition must happen more quickly, with international collaboration and consensus vital on the issue to safeguard the future of our planet.



Michelle Gardner
*Head of Public Policy,
Logistics UK*

Logistics UK and its members are keen to support global environmental ambitions wherever possible; that is why we are launching our environmental manifesto on 10 November 2021 – Transport Day at COP26 – to communicate with government and other stakeholders the support industry needs to reach net zero by 2050. The manifesto will be launched via a virtual event, hosted by David Wells, Logistics UK’s Chief Executive, and will feature a selection of member case studies. For more information, and to book your free place – open to all – please visit <https://logistics.org.uk/campaigns/environment/cop26-the-route-to-net-zero-for-logistics>.

ROAD TRANSPORT

According to COP26’s research, road transport accounts for 10% of global emissions, and its emissions are rising faster than those of any other sector; decarbonising this industry is an urgent priority and COP26 leaders are calling on countries and states, vehicle manufacturers, and fleet-owning businesses to all play their parts on the global journey towards net zero emissions.

At a national level, the UK government intends to phase out the sale of new diesel and petrol HGVs by 2040, subject to consultation, in addition to a 2035 phase-out date for polluting cars and vans. While electrification currently offers the most viable solution for lighter commercial vehicles (LCVs) – and these vehicles are more readily available for purchase across the UK – the picture for heavy goods vehicles (HGVs) is more complex and uncertain, with government feasibility studies now exploring three zero-tailpipe emission options: battery electric, electric road systems and hydrogen. Moving to zero tailpipe emission technologies presents a significant challenge as the vehicles must be able to perform all the same functions and operations as effectively as their diesel equivalents, in a similarly cost-effective way for businesses.

Logistics UK supports the setting of phase-out dates for petrol and diesel vehicles but to achieve these, industry must have access to the right vehicles and supporting infrastructure, as well as improved availability of low carbon fuels, fiscal incentives, and long-term government support to facilitate the transition.

As many operators are already in the process of electrifying their van fleets, they are facing challenges with the cost of installing charging infrastructure at their depots, alongside the additional cost if a power upgrade is required to provide sufficient recharging capacity. This process can cost millions of pounds and is often not viable commercially, especially if businesses lease their premises. Power upgrades are more likely to be needed if operators switch to battery

electric HGVs in the future (over other alternatively fuelled vehicles) as these vehicles will have larger batteries that will require increased charging capacity.

To overcome these challenges, Logistics UK is calling for increased support for the industry to facilitate the switch to EVs, including a fair and equitable apportionment of the costs of increasing energy supply to commercial vehicle operators’ premises, and for energy supply upgrades to be timed to co-ordinate with vehicle purchases to avoid delays in bringing new vehicles into operation. Not all charging and refuelling for zero-tailpipe emission technologies can be achieved at depots. Vans are often taken home by employees and, for HGVs or vans travelling long distances, recharging or refuelling will still need to take place en route. For this reason, the government must ensure the UK has ample charge point coverage across the entire strategic roads network. These concerns are similar for hydrogen fuelled vehicles and electric road systems – the infrastructure and technologies must be in place to support their widespread use before businesses make significant investments into new vehicle technology.

MULTIMODAL

All modes of logistics transport are of crucial importance to moving essential goods and supplies around the UK and beyond. Like road transport, significant challenges and opportunities exist for decarbonising air, rail and water transport modes. While modal shift from road to rail and waterborne freight can deliver environmental benefits, the government should not dictate which mode is selected; the right policy framework will enable rail and water freight to offer an alternative to road so that each mode is able to play its optimal role in the supply chain. Advances in technologies for low carbon solutions for air, rail and sea freight transport are progressing fast; it will take industry and government working together to realise the net zero by 2050 ambition.

RAIL FREIGHT

Electrification offers a clear path to net zero for the rail sector. Unlike the passenger rail sector, where the government procures a significant proportion of new rolling stock, rail freight stock is owned and operated by private sector companies who rely on long-term policy signals from the government to guide investment decisions. Certainty around the government’s electrification programme will provide the incentives required for operators to invest in electric rail freight locomotives and for manufacturers to produce them for the UK market; we are calling on the government and industry to accelerate the delivery of the electrified rail network.

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AIR FREIGHT

Air freight is a crucial element of logistics in the UK, accounting for 40% of UK imports and exports by value. Airlines are upgrading their fleets continuously with new, more fuel-efficient aircraft. The use of biofuels or jet fuel created from energy from waste is increasing and ground operations are moving towards becoming carbon neutral quickly. The industry is also using innovative solutions to decrease waiting times for cargo planes through digital platforms, making operations more efficient.

Logistics UK supported several elements of the government’s Jet Zero consultation, which included a package of measures to accelerate the development of sustainable aviation fuels and zero emission flights. Logistics UK calls on the government to continue to support these efforts to help the UK become a global hub for low-emission aviation.

WATER FREIGHT

The UK has a thriving maritime and ports sector, with 90% of goods coming into the UK arriving by sea and 15% of domestic freight moved by water. With excellent maritime facilities nationwide, ensuring ports and wharves have effective road and rail connections will support environmental goals and regional development. With increased government support to promote modal shift, and policy frameworks that protect and expand our inland waterway freight infrastructure, use of these modes could grow even further and reduce pressure on the UK’s congested roads, in addition to decarbonising the logistics sector.

Inland waterways are also an important, but often overlooked, transport mode. Freight transport on the Thames and the Manchester Ship Canal is growing, but more could be done to boost freight on the canal network. The government should use the periodic funding settlement for the Canal and Rivers Authority (CRA) to ensure that

the CRA directs a sufficient proportion of investment to its strategic canal freight network, such as waterway links between the Port of Humber and the city of Leeds.

ROUTE TO NET ZERO COMMITMENT

As the largest business group representing the sector, Logistics UK is asking its members to commit to decarbonising their operations as quickly, effectively and as urgently as possible to help the UK achieve carbon neutrality by net zero by 2050.

We know the pathway to net zero will be challenging for many of our members, as the technology solutions are still being developed, but we will work to ensure our campaign is meaningful and can translate into real action.

To sign up to the *Route to Net Zero* pledge, please complete the application form, available to download here and return, along with a copy of your company’s CSR/Environmental Report to Michelle Gardner: mgardner@logistics.org.uk.

Once your application has been reviewed, and if it is approved, a member of the team will be in touch with your *Route to Net Zero* pack, which includes a pledge certificate to sign, and social media and marketing materials to promote your involvement. A member of the communications team will also be in touch about PR, social and *Logistics Magazine* opportunities, if you expressed willingness in your application.

If you have any questions about your application, please contact Michelle Gardner.

This article provided a brief overview of Logistics UK’s environmental manifesto, to understand the full picture, make sure you sign up to the virtual launch event on 10 November 2021, here: www.logistics.org.uk/campaigns/environment/cop26-the-route-to-net-zero-for-logistics ■



The road to net zero

Following the launch of the government's *Transport Decarbonisation Plan*, we know that the logistics sector is under ever increasing scrutiny from customers, regulators, and journalists. It is also true that your stakeholders and customers are expecting action, so it is vital to start implementing and testing solutions and be seen to address the challenge.

We understand that infrastructure changes require significant time and investment so you need an environmental partner who can help you develop innovative solutions tailored to your individual challenges as part of a strategy to tackle a range of problems.

UNDERSTANDING YOUR ASSETS

Before you can implement a wholesale energy infrastructure shift, you need to understand your current infrastructure to establish a baseline, identify the risks and understand where the greatest emissions are coming from.

Through improved data capture, better operating practices, and investment in new and emerging technologies, you can significantly reduce your energy consumption and carbon emissions.

DESIGNING AND INSTALLING NET-ZERO INFRASTRUCTURE

Diversifying your fuel type, whether that be to electric, hydrogen or synthetic fuels will require new infrastructure.

An efficient, effective, and environmentally responsible decommission demands a wide-ranging team of experts – from geo-environmental specialists and DSEAR (Dangerous Substances and Explosive Atmospheres Regulations)-qualified demolition engineers, to skilled project managers, who co-ordinate the entire operation. An experienced partner will ensure every decommission is responsibly managed from first inspection to final handover, protecting assets, investments, and business growth – and the vital natural resources they are built upon.

MAINTENANCE OF LEGACY INFRASTRUCTURE

Maintaining your existing ageing infrastructure is important to reduce the impact of pollution from fuel leaks and tank failures.

You need a partner that can support you with the technology of today and can prepare you for the future, designing a strategy of maintenance, testing and inspection that fits around your unique decarbonisation journey. An evolving programme of infrastructure maintenance, testing and inspection will ensure your operation remains safe, compliant and cost effective.

THE ENERGY FUTURE

We know that hydrogen will be an enabler particularly in the transport sector and that is why we have joined the Hydrogen Now strategy to unlock the UK's hydrogen economy as part of our post-COVID economic recovery.

SPECIALIST SUPPORT

A specialist will work with you to develop a strategy to transition your energy through design and installation of new assets.

Working with an environmental risk reduction specialist with a full suite of turnkey solutions will help you plan your decarbonisation strategy, so your operation remains safe, compliant, and cost effective.



Matt Tolan

*Business Development
Manager – Logistics,
Adler and Allan*

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In profile: Professor Philip Greening

Unusually for an academic, Philip Greening spent much of his early working life in industry, starting as an engineer and ending as a senior supply chain consultant for a global logistics company. Following an MSc course at Cranfield University, he decided to study for his PhD relatively late in life – in his mid 40s. Before finishing his doctorate, he was offered a job as research manager at the Centre for Sustainable Road Freight (SRF) at Heriot-Watt University in Edinburgh.



Matt Harrington

Editor

SRF brings together three of the UK's leading academic groups: the Cambridge University Engineering Department, the Logistics Research Centre of Heriot Watt University and the Freight and Logistics research group at the University of Westminster, along with industry and government partners. Its aim is to make road freight environmentally, economically, and socially sustainable.

ESTABLISHING PATHWAYS FOR DECARBONISATION

When he first joined SRF in 2012, the objective was to establish pathways for decarbonisation.

"The question was," he said, "what can we do to deliver an 80% reduction in carbon emissions? That mission has now changed to net zero."

The starting point for the research was to look not just at the technical aspects of the vehicles used, but to look at the organisation of logistics too.

"Logistics defines the vehicle's needs, and the engineering capabilities define the vehicle that is used for logistics operations," he explained, "So you have this sort of circular relationship, you can't really separate them."

MAXIMISING MARGINAL REDUCTIONS

On the engineering side, Greening and his colleagues looked at measures like aerodynamics, tyre pressure, low-rolling resistance tyres, light weighting, alternative fuels and ways of feeding back to the driver so that the way they drove was more eco-friendly. On the operational side, they looked at how to load the vehicles more efficiently, how to reduce demand, and how to change the attitudes and behaviour of the driver.

Following its first five years' work, SRF produced a report for the Committee for Climate Change, which fed into the fifth carbon budget.

"The conclusion of that was that you can't really achieve an 80% reduction using the things that are available to us now," Greening said, "You will need radical change."

TESTING IN A VIRTUAL WORLD

Based on its learnings, SRF put forward a proposal for the second phase of its work.

"The question we were trying to answer was: what does that radical change look like?" Greening said, "The way we approached that was through a modified living lab approach."

A traditional living lab is where you have a real-world demonstrator of the technologies that you choose to deploy. The modification SRF made was to build high-fidelity, large-scale computer models, which are virtual worlds where you can simulate decisions – and the consequences of those decisions – down to truck level.

The main benefit of this approach is speed: "You can look ahead five years in an hour, whereas if you're trying to do that in the real world it would take you five years."

A secondary benefit is that you can measure the system at a whole system level – nigh on impossible to achieve in the real world.

"When you're talking about radical change that's important," Greening said, "because you get these unexpected consequences that crop up. Then what you can do is run the virtual world again with a slightly different set of parameters to see how robust your solution is."

Rather than looking for an overly optimised solution that only fits one set of circumstances, the SRF team looked for robust solutions that are both significantly better and deliver for net zero outcomes.

GOVERNMENT PLAN EMBRACES RADICAL CHANGE

The SRF team's call for radical change in road freight emissions seemed to be answered following the publication of the government's *Transport Decarbonisation Plan* in the summer. What did Greening hope and expect to see from the plan ahead of its publication?

"I think everybody wanted clarity," he said, "Everybody accepts that things are going to change, but clarity about when and how and under what conditions. And to be fair to everybody that's a very big ask. It's not such a big ask if you're talking about incremental change, it's a massive ask when you're talking about radical change."

While he believes the plan leaves a lot of questions unanswered, its benefit from a research point of view is that

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it sets out an agenda to make things clearer over the next two or three years. Timescale is the most pressing issue.

“When you’ve got a pressing deadline, and it’s a fixed deadline, this is what isn’t totally appreciated by the business community generally, by the government, by even the broader population,” he said, “The climate science is telling us we have to do something by this point in time.”

While Greening concedes that the government’s plan moves the decarbonisation of transport as fast as it needs to go conceptually, in terms of target setting, he argues that in terms of operationalising that plan, it seriously underestimates the level of investment that will be needed, both centrally and from organisations.

BATTLING SYSTEMIC INERTIA

The challenges the industry faces now are a consequence of inaction over the past decade, Greening maintains.

“We have to start turning down the amount of CO₂ that we’re emitting or reducing it. If we’d started that in 2010 and maintained a trajectory, year on year, the incremental changes are relatively small. I think that was everybody’s ambition, that really was what people wanted to do. The reality though was that definition of a gradual transition didn’t take into account the inertia of the existing system.”

Citing the example of an operator that procures a fleet of new trucks in 2010 and has to run them for seven years, he said: “If you’ve just bought a new fleet of trucks you’re looking at 2017 before you’re going to introduce any technology change. These things are inertia attacks and have proved much more difficult to overcome than we perhaps anticipated in the early days.”

The consequence of that is that CO₂ emissions have followed broadly the same, slightly higher, trajectory for too long. “That transition is looking very steep and understandably scary to operators and governments,” Greening said, “But that’s what you have to do.”

CONSULTATION ON PHASING OUT DIESEL HGVS

The consultation that accompanied the government’s *Transport Decarbonisation Plan* to phase out non-zero emission HGVs by 2035-40 took many in the industry by surprise. Does Greening think these targets are realistic?

“The point is can it be done from a technology perspective?” he said, “In other words will the technology be available seven years before 2040, if we take that sort of timeline? The technology is there now, so we can build big battery trucks, some manufacturers are offering those commercially now.”



PROFESSOR PHILIP GREENING
Deputy Director, Centre for Sustainable Road Freight

“Over the seven years that I’ve been involved ... the funding for that particular research project has more than doubled. It was a five-year £5 million project, now it’s nearer £10 million and scheduled to run until 2023 at least.”



One pressing challenge is whether the technology can be made mature enough for that transition by 2040. "At this point in time it looks as though that can be achieved," Greening said, "but do not underestimate the cost of doing that. You've got OEMs who have to change their production lines, you've got real cost issues to the industry about what trucks are going to cost. Thirty per cent or even double the cost of your existing diesel truck. You have infrastructure that has to be in place and that probably is the biggest challenge."

THE PROBLEM WITH HYDROGEN

The three main potential solutions for zero-emission truck technology are now accepted to be battery operated vehicles (BEVs), electric road systems (ERS) and hydrogen.

While he is more open to the potential of hydrogen than his SRF colleague Professor David Cebon, a well-known hydrogen sceptic, Greening argued that the fuel's big weakness is that it is energy inefficient.

"That inefficiency will come at a cost," he said, "Nobody really knows what that cost is, because we don't know what the cost of hydrogen is going to be in the future because we don't produce very much of it at the moment. There's a wide range of projections for that, so it may or may not matter. But it will take more energy to run your trucks on hydrogen."

There is also the infrastructure challenge, which is the need to move the hydrogen to the right places. "You're going to have to increase your tanker fleet significantly to be able to move hydrogen around," Greening said, "Or you're going to have to have local production, which at the moment is prohibitively expensive."

BATTERY COSTS FALLING, EFFICIENCIES GROWING

Greening said the industry had been in the battery game long enough to see that there is a definite trajectory of falling battery costs, as well as the promise of improving efficiency with new chemistries on the horizon.

"The weakness with batteries is probably to do with natural resources," he said, "Where are they? And how much of them do we have? Because if we're going to have to increase our reliance on batteries and the chemicals that go into them, then that may be the limiting factor."

ELECTRIC AVENUE

The electric road system, Greening believes, has the attraction of being able to run hydrogen fuel cell vehicles and battery vehicles, but you reduce the size of the batteries, or the need for hydrogen, by running on direct electricity for as long as you can.

"The challenge to the electric road system is a bit like the HS2 situation," he said, "There's a lot of upfront investment required for future benefits. It's very, very strategic."

International compatibility is also an issue. "If you can only run UK trucks on the electric road system and nobody else in the world is doing it," Greening said, "then there's a big challenge because logistics doesn't respect borders in that sense. Trucks will have to move across borders and they need to be able to operate wherever they go."

COP26 – AN OPPORTUNITY TO LEAD THE CHARGE

As world leaders plan to descend on Glasgow for the COP26 international conference, does Greening think this is the UK's chance to take the lead in pushing the transport decarbonisation agenda?

"It's an opportunity," he said, "Whether the government takes the opportunity and wrestles it sufficiently is the question, but this is the best opportunity it's going to have. At the moment the world's got lots of different strategies in different geographies. Somebody has to bring those together and harmonise them."

Transport day at COP26 will be on 10 November and zero-emission transport is expected to be high on the agenda. What does Greening hope and expect to come out of this?

"A solidified plan," he said, "At the moment what we've got for HGVs is three demonstrator themes being carried out: hydrogen, ERS and battery. They are just feasibility studies, they all need to find their way into demonstrator programmes."

"Next year and the year after is pretty much all we've got. We're going to invest £100m in demonstrating each of these technologies and need a clear strategy for deciding on which option or options to pursue."

LOOKING AHEAD TO 2050

How optimistic is Greening that the UK will be able to transition to a net zero transport sector by 2050?

"I'll start by saying the technology is there. This is about investment, both private and public. The commitments from government, if taken at face value, means that it will get behind it and increasingly, with big organisations at least, I'm finding that they are frustrated at the slow speed at which we're moving. So big companies are actually starting to lead the charge to net zero."

One characteristic of the UK logistics sector, however, is that it has a long tail of small companies.

"That is challenge space," he said, "How do we take them along, because typically they're operating second hand vehicles. They're already looking at the diesel fleet that exists as their next vehicles and that will slow things down. There isn't at the moment any focus on that long tail and how that will change."

Greening argues that big companies are not just leading the charge because government is telling them to do it, but because their Corporate Social Responsibility activity is of increasing weight for external investors.

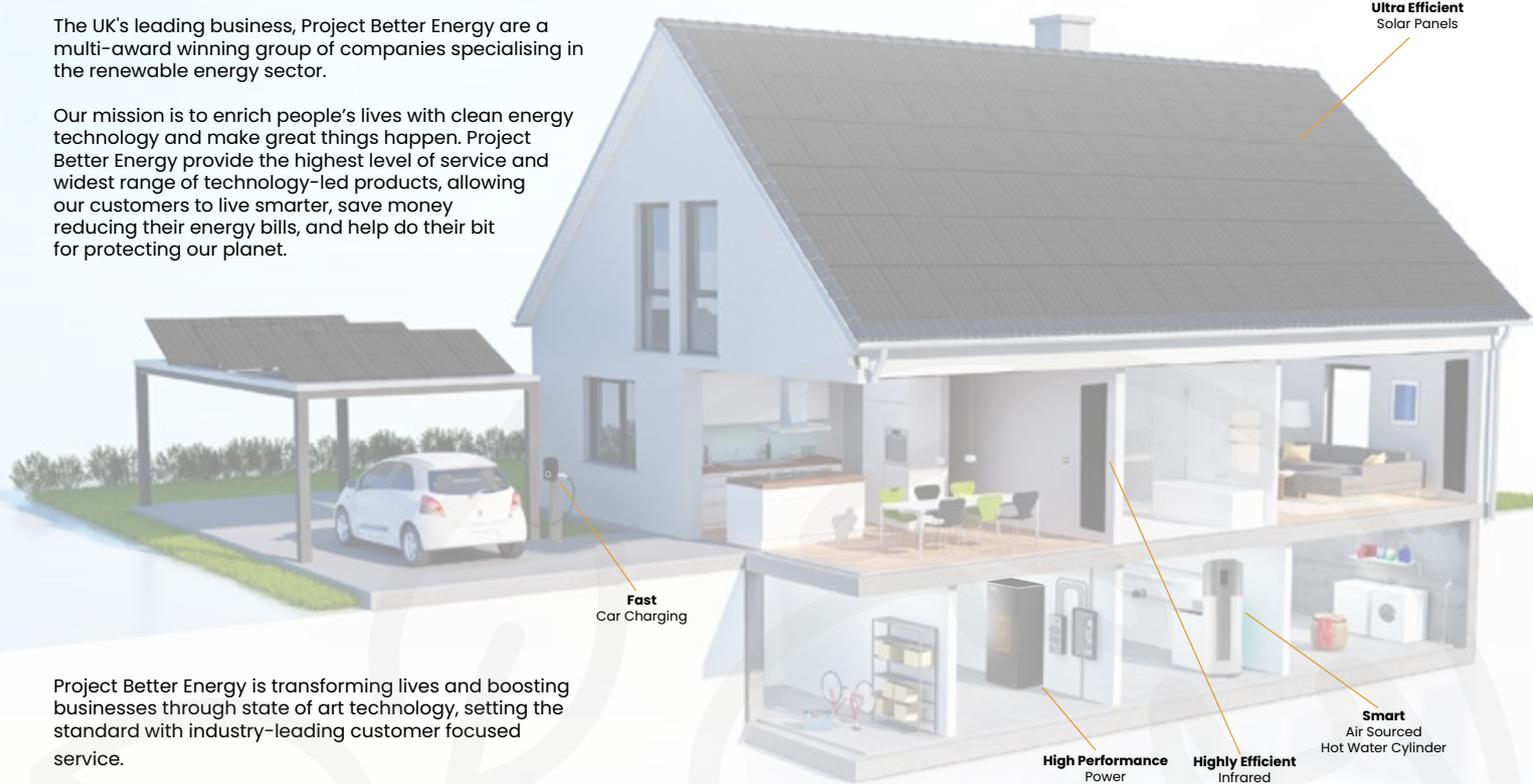
"It's the investment community that is actually saying to people like Sainsbury's and Tescos and DHL, unless you invest in net zero pathways, you are not attractive to us and we will not give you the money that you want" he said, "In which case you will be not as competitive because you won't be able to make the investments that someone else can make. So it's the financial structures that are adapting for big companies." ■

SOLVING TOMORROW'S SUSTAINABILITY CHALLENGES

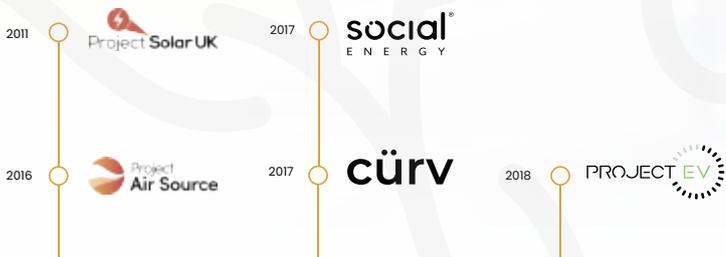


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Decarbonising the heavy end of the fleet

Almost one sixth (16%) of domestic Greenhouse Gas (GHG) emissions were from HGVs, according to 2019 figures from the Department for Transport. But HGVs are also widely accepted to be among the most difficult parts of the commercial vehicle fleet to decarbonise.

In its *Transport Decarbonisation Plan* published this summer, the government said that “the next decade will see rapid progress and investment in zero emission technology options for larger HGVs, alongside deployment of supporting infrastructure.”

So, what are the frontrunner zero-emission options for these vehicles? It is not the government’s job to pick winners, but its feasibility studies are now exploring three main options for zero-emission HGV technology: battery electric vehicles (BEVs), hydrogen-powered vehicles and overhead catenary-powered vehicles, otherwise known as electric road systems.

Here, we ask three businesses that are developing this zero-emission technology to set out their stalls.



BATTERY ELECTRIC VEHICLES

In the late 19th Century, inventors Thomas Edison and Nicola Tesla were adversaries in ‘The Current Wars’, pitting lightbulb innovator Edison’s direct current (DC) against Tesla’s alternating current (AC).

It was a significant, if much-exaggerated, battle over whose electrical system would go on to power the planet. The clash captured the imagination of a world racing headlong into the electric era, an epoch that would bring many breathtaking possibilities, comforts and efficiencies.

In more recent times, a similar tussle has seemingly ensued between companies cheerleading for pure EVs, fuel cell technology and catenary options. The fact is, however, that the so-called battle is not the elephant in the room it would seem.

Here at Tevva, we have long believed that the future of decarbonising transport would not rest solely at the feet of just one of these technologies. Our drive and focus have always been to make EVs as cost-effective and operationally flexible as their diesel equivalent. That purpose is couched in terms of using the best technology at our disposal, including fuel cells.

We recently unveiled our brand-new 7.5t BEV to much fanfare. It’s a British-built truck that’s set to begin rolling off the production line in 2022. But it is only the first in a sequence of range-extended vehicles (up to 19t) that will comfortably meet (and exceed) many demanding duty cycles.

Among other things, the BEV includes a payload of more than two tonnes, comprehensive telematics, platform space for 16 Euro pallets and a charging time of five-to-six hours from fully depleted to 100%.

At its Alexandra Palace debut, it was made clear to us by fleet operators and other visitors, just how urgently EVs are needed to help drive down the millions of tonnes of carbon being spilled into the atmosphere annually.

Tevva, fuelled by the climate change threat and the desire for a better and more economically efficient use of relevant technologies, is determined to meet that need. We are also locked in on the easing of range anxiety, arguably the biggest barrier to clean vehicles ruling the roads.



David Thackray

Sales and Marketing Director, Tevva Trucks

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The power source for EVs must make both business and environmental sense for it to easily replace fossil fuels. That's why Tevva is developing hydrogen fuel cell technology, a power source that acts as a back-up for our trucks, quickly recharging as a driver continues their duty cycle.

Currently, processing hydrogen for fuel cells remains an inefficient business. But we believe that hydrogen will, in time, prove to be the liberator of batteries, a perfectly suited additional power source working hand-in-hand with battery power to provide a viable, zero-emission diesel alternative.

With that in mind, Tevva has been developing hydrogen-based, range-extension technology for current customers.

If Tesla and Edison's skirmish teaches us anything, it's that an "all-of-the-above" approach to decarbonising transport is the most fruitful route to net zero goals. Companies in the business of attaining these goals could do worse than let this be their lightbulb moment.



HYDROGEN-POWERED VEHICLES

Greenhouse gases released from transportation account for a third of the UK's total carbon emission. It's a sobering statistic. And whilst battery powered vehicles are becoming a popular option for household cars, heavy-duty forms of transport need a mix of solutions in order to reduce reliance on traditional combustion engines.

Here at Wrightbus, we've pioneered zero emissions transport. Our hydrogen double decker is a world first, a tremendous accolade for our Northern Ireland factory, and this year we followed with a battery option for inner city routes.

There is no doubt batteries have their place, but there are also issues with batteries when you start scaling up their use. If you want to upgrade all the fleet vehicles in the UK for instance you would need to build 2,300 charging stations between now and 2050. And the cost of electrifying the grid to cope? Estimates range from £300bn to £500bn.

The battery vehicle market also relies on batteries being imported from abroad, mainly China, which produces 72% of the world's batteries. We just don't have the people or the technology in the UK to make it a competitive fight.

In reality, you will only get mass adoption of zero-emission vehicles when it costs the same, when it does the same and when it is as easy to fill up as petrol or diesel. So we feel the main solution to that problem is hydrogen.

Hydrogen operates in a similar manner to the way petrol and diesel works today. The production system is also similar. Oil is produced in a refinery and delivered to a petrol station. Hydrogen can be created at an offshore wind farm and delivered to a fleet station. There is no need for a change of behaviour. And at the end of the

process, the only emission from hydrogen-powered vehicles is water. Indeed, when people see the tailpipes on our buses dripping with nothing other than pure H2O they are astonished.

In Britain, as many staycationers found out this year, we have an abundance of wind and water, and we can turn that into energy. There are also ways of producing hydrogen from waste plastics. In fact, there are no limits to hydrogen.

The UK's hydrogen economy starts with buses today, but can be used in other heavy and large vehicles, like



Jo Bamford
Chair, Wrightbus



lorries, trains and ships. It could be heating our homes and powering heavy industry.

Batteries will remain a popular option and provide the solution in certain situations. But ultimately, if we don't invest in UK hydrogen technology, we will miss a major opportunity to create and sustain hundreds of thousands

of high-quality jobs in all parts of the UK, covering many different sectors. We have the opportunity to lead the world in hydrogen production but that needs to start now. It may not be the perfect solution – nothing is – but we can make a difference to the planet by investing now in all our futures.

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Justin Moss

Head of Electrification,
Siemens Mobility Limited

ELECTRIC ROAD SYSTEMS

Since the summer of 2016, European haulage companies have been using overhead lines to power artic 40t trucks in daily operation on motorways.

The overhead catenary allows direct electric operation under the contact lines while the on-board energy storage is re-charged for electric drive on non-electrified routes.

The trucks used are hybrids, which allow the full operational flexibility you would expect from conventional trucks, both in terms of range and payload.

The system does not require large on-board batteries, so reduces the need for long waiting times for electric charging. The system also has much lower operating costs (cost/km and maintenance).¹

Just as importantly, we can considerably reduce CO₂ emissions with the development of a national overhead line network², which is further improved if renewable electricity is used.

This potential increases considerably if the overhead catenary network is international and planned in a coordinated way, as Germany's Federal Ministry of Transport and Digital Infrastructure (BMVI) has proposed.³

The success of these first projects was made possible not only by technological development on the vehicle side, but also by the planning and preparation of the infrastructure.

On some of Europe's busiest motorways, this innovative solution of overhead catenary for trucks was implemented in record time as a relatively simple upgrade to the existing infrastructure.

Projects already in operation or recently announced will ensure that more than 20 trucks from Scania (including one BEV) as well as trucks from other suppliers (including combinations with FCEV and BEV) are used in the German field trials in the next one to two years and an extension of 7 km of the first field trial near Frankfurt has already been announced.

To create and stimulate the market for climate-friendly road freight transport, the German Ministry for Transport (BMVI) has announced that it will provide €4.1 billion for major innovation clusters in the period 2021-2023, including for overhead lines.

Two larger pilot projects with overhead catenary for trucks were announced in September by the BMVI. The deployment of these innovation clusters is planned in the German states of Hesse and Bavaria.⁴ The total distance of these two innovation clusters will be more than 200km.

In parallel to the innovation clusters, the BMVI will approach European partners to exchange analyses and experiences on how best to achieve the targets for reducing greenhouse gas emissions in articulated truck long-distance transport.

Several independent analyses, including from the BMVI's own advisory body National Platform Future of Mobility (NPM), have shown that trucks with overhead lines will continue to offer the lowest total cost of ownership and CO₂ reduction costs in 2030.⁵

Several European countries are also considering their own motorway electrification projects for articulated trucks, with those around the North Sea being especially active. These political efforts complement the development of technical standards, which are already well advanced within the European Committee for Electrotechnical Standardization (CENELEC) body thanks to the many existing standards and experiences for overhead contact lines.

Thanks to existing supply chains for core components, it is possible to mobilise resources and manpower for a large network of overhead lines by 2030.

It could serve as the energy backbone for both hybrid trucks (which may play an important role in the transition phase) and zero-emission trucks (eg BEV or FCEV), which

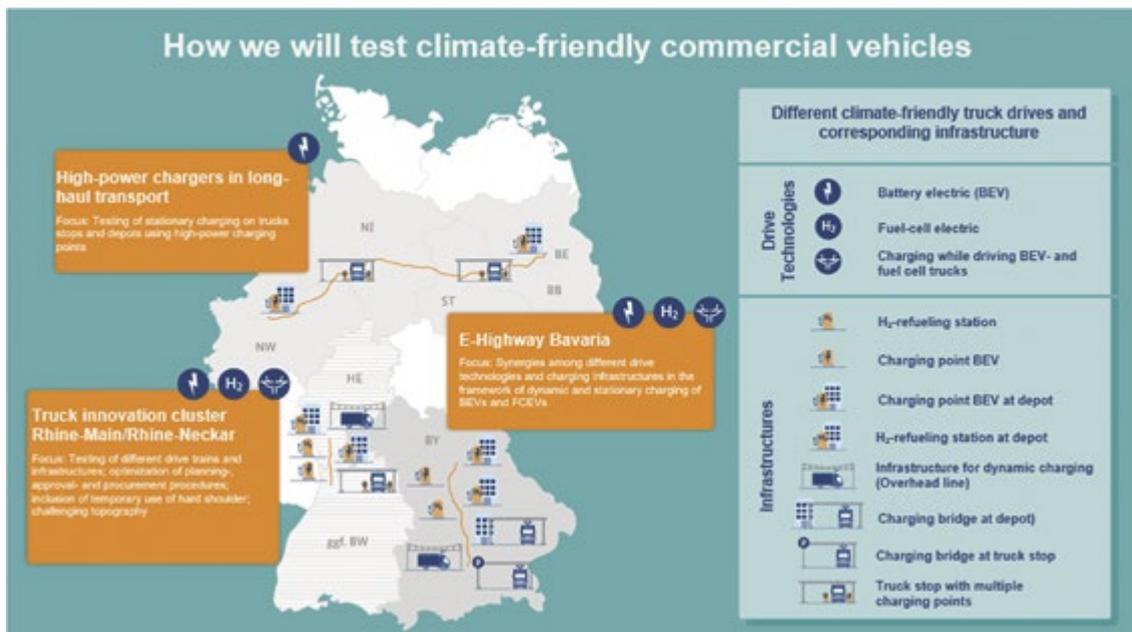


eHighway (field trial ELISA) on motorway A5 near Frankfurt, Germany

are likely to make up the bulk of the articulated truck fleet in the long term.

This backbone would be fully compatible and even complementary with other possible new road freight technologies, such as the increasing use of automated trucks on motorways or the use of high-capacity vehicles (“Gigaliners”). This will ensure that the road freight system of the future can be both green and smart.

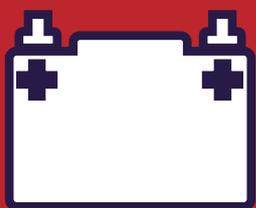
Source: BMVI (German content translated)



- 1 “Decarbonising the UK’s Long-Haul Road Freight at Minimum Economic Cost” (Center for Sustainable Road Freight – CSRF) and podcast “Journey to zero” with Prof. Cebon at CSRF about electric roads using overhead catenary: www.csrf.ac.uk
- 2 “StratON - Bewertung und Einführungsstrategien für oberleitungsgebundene schwere Nutzfahrzeuge” (Öko-Insitut) <https://www.oeko.de/fileadmin/oekodoc/StratON-O-Lkw-Endbericht.pdf> and “Roadmap OH-Lkw: Einführungszenarien 2020-2030” (ifeu) <https://www.ifeu.de/fileadmin/uploads/Roadmap-OH-Lkw-Bericht-Einfuehrungszenarien-web.pdf>
- 3 “An Overall Approach to Climate-Friendly Commercial vehicles” (German Federal Ministry for Transport) https://www.bmvi.de/SharedDocs/EN/Documents/overall-approach-climate-friendly-commercial-vehicles.pdf?__blob=publicationFile
- 4 Press release (German) by the German Federal Ministry for Transport, Sep 8th, 2021. <https://www.bmvi.de/SharedDocs/DE/Pressemitteilungen/2021/104-scheuer-innovationscluster-strassennutzverkehr.html?nn=13326> and by the Bavarian Ministry for Transport, Sep 8th, 2021. <https://www.stmb.bayern.de/med/pressemitteilungen/pressearchiv/2021/177/index.php>
- 5 AG 1 - Werkstattbericht Nutzfahrzeuge (NPM) page 23 https://www.plattform-zukunft-mobilitaet.de/wp-content/uploads/2020/12/NPM_AG1_Werkstattbericht_Nfz.pdf

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Charging ahead – helping fleets go electric

A TRANSFORMATIVE DECADE

The 2050 deadline for the UK to reach net zero seems a long way off, but the 2020s are set to be a transformative decade on the road to hitting our environmental targets. It is the decade when many of the critical steps will be made and electric vehicles are set to enter the mainstream. In London and the south east of England alone, there are just over 150,000 electric vehicles today. By 2030 that number could rise to anything between 2.6m–4.5m. The scale of the change we will experience cannot be underestimated.

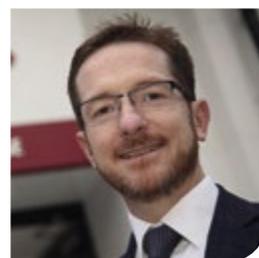
UK Power Networks is the electricity distribution grid serving 8.3m homes and businesses in our operating areas of London, the east and south east of England. We don't generate or supply energy, but we operate the cables and substations and it's our responsibility to secure a safe, reliable and efficient service. You might not have heard of us yet, but if you have plans to take your fleet electric then we are the people who can help – it is estimated

that 90% of charge points will be connected to the local distribution network. When you are ready to electrify your fleet, your electricity distribution network will be able to help you connect at the lowest cost.

IMPACT OF FLEETS

Going electric has clear reputational benefits for customers, with many firms' electric vans proudly displaying their environmental credentials. We know that 90% of new van sales are registered to companies, meaning we expect a faster switch to electric power from vans than cars, where a much higher proportion are bought privately.

There has been clear progress in electrifying HGVs, even if the technology is still a little further off. Manufacturers are working to understand the operational characteristics of electric trucks and investigating ways to maximise their output to help the return on investment. One area currently being looked at is the flexibility offered by being able to



Ian Cameron

Head of Customer Service and Innovation, UK Power Networks

modify the battery size or number of batteries, trading off a shorter range for a larger payload. The Zemo Partnership (formerly Low Carbon Vehicle Partnership) published a valuable piece of research in July 2020 with its Low Emission Freight & Logistics Trial. It found that both van and HGV operators involved in the trial reported significant wider operational benefits, and the operators involved are now fully committed to accelerating their adoption of the technology

ESTABLISH YOUR DEMAND

If you have a return-to-depot fleet model, the first step to getting your fleet ready to go electric is to establish how much electricity you are currently consuming on your site and at what times. The key piece of information you need to obtain is what your maximum peak electricity demand is – the highest amount of electricity used at your site at any given time.

Getting accurate information can be achieved in many ways, but arguably the most effective approach is using a smart meter. Smart metering is a core part of understanding energy usage, as well as being an enabling technology for many of the tariffs specifically designed for EV users. If you don't already have a smart meter, talk to your energy supplier who can arrange for one to be installed for free, and in the meantime, check with your supplier about your maximum demand.

IMPACT OF EV CHARGING

The next step involves understanding the potential impact of EV charging on your maximum demand.

This will require you to identify your EV chargepoint specification, including how many chargepoints you need and what power rating they should be. Your chargepoint installer will assist you with this, helping you pick what is best suited for your needs. Some questions that may be helpful to consider as part of this process are:

- What type of EVs do I need?
- How much time will I have to charge my EVs before I need to use them again?
- How many vehicles will I need to charge at any one time?
- When will I need to use the chargepoints (all day every day, overnight only, when vehicles return, etc)?
- Will most of my charging be topping up (eg from 80% state of charge to 100%) or do you expect to be recharging from close to empty?

EXPLOIT SMART

UK Power Networks has led the way in developing a series of products that aim to cut the cost of fleets going electric. Our flagship demonstrator project Optimise Prime is developing a series of practical measures that address the capital hurdles preventing fleets from going electric. The project has recruited high profile partners in Centrica, to look at how fleets charge at home, Royal Mail to research fleets charging at depots and Uber to gather data on fleets that charge in a mix of places.

The options available to you include:

- **Smart Charging:** Enables cheaper and faster connections for fleets that are able to shift the time their vans are charged. This is especially helpful for fleets that do not need to charge at peak times in the morning and early evening.
- **Profiled Connections:** This is when the maximum power of your connection varies according to the time of the day, split into 48 half-hourly slots throughout the day. In practice this means you can charge more vehicles at times when there is lower demand in your local area.
- **Site Planning Tool:** Optimise Prime is developing a freely accessible online tool that will help depot-based operators plan the electrification of their fleet. By inputting details like your maximum demand, typical mileage, vehicle schedules and location the tool will generate information like estimated EV charging schedules and costs, load profiles of the site and potential infrastructure requirements.

TALKING TO UK POWER NETWORKS

Once you have a better understanding of your existing electricity demand and how the way in which your plan to charge at your depot could impact your power requirement it would be a great time to talk to us.

As well as providing lots of online resources and guides to help you understand how to get the power you need for your depot we offer an 'ask the EV expert service'. As well as answering any email queries you might have we also provide online or face-to-face surgeries. We will explain how your proposals fit in with the local electricity network and we can talk you through your options to minimise any costly upgrades. These services are all free of charge. If you want more detailed feasibility studies to help you make your investment case, we can provide those as well.

This pre-application support will ensure that if, and when, you do require an upgrade to your supply we can work together to do this as efficiently and cost-effectively as possible. ■

FURTHER INFORMATION

★ *Optimise Prime:* <https://www.optimise-prime.com/>

★ *Energy UK/UK Power Networks guide to connecting your fleet:* <https://www.energy-uk.org.uk/media-and-campaigns/energy-uk-blogs/7656-connecting-your-fleet-a-simple-step-by-step-guide-to-installing-ev-chargepoints.html>

★ *Help and advice from UK Power Networks on installing an EV charger:* <https://www.ukpowernetworks.co.uk/electricity/electric-vehicle-charging-point/electric-vehicle-charging-point-help-and-advice>

Why multimodal matters

Road transport accounts for more than 78% of goods moved within the UK, according to 2019 statistics from Department for Transport. But in the drive to decarbonise transport, the other modes of logistics are becoming increasingly important. Here we share just three examples of how modal shift to road, air and water can help deliver impressive environmental benefits.

MULTIMODAL LOGISTICS

- ★ www.logistics.org.uk/air
- ★ www.logistics.org.uk/water
- ★ www.logistics.org.uk/rail



AIR

DHL EXPRESS ORDER 12 ALL-ELECTRIC AIRCRAFT

When DHL Express, a longstanding Logistics UK member and leading express service provider, announced this summer that it was to order 12 fully electric Alice eCargo planes from Eviation, a Seattle-area based global manufacturer of all-electric aircraft, it marked a new chapter in aviation history. DHL aims to set up an unparalleled electric express network and make a pioneering step into a sustainable aviation future. Eviation's Alice is the world's leading fully electric aircraft, which enables airlines – both cargo and passenger – to operate a zero-emission fleet. Eviation expects to deliver the Alice electric aircraft to DHL Express in 2024.

“We firmly believe in a future with zero-emission logistics,” says John Pearson, CEO of DHL Express. “Therefore, our investments always follow the objective of improving our carbon footprint. On our way to clean logistics operations, the electrification of every transport mode plays a crucial role and will significantly contribute to our overall sustainability goal of zero emissions. Founded in 1969, DHL Express has been known as a pioneer in the aviation industry for decades. We have found the perfect partner with Eviation as they share our purpose, and together we will take off into a new era of sustainable aviation.”

Alice can be flown by a single pilot and will carry 1,200 kilograms (2,600 lbs). It will require 30 minutes or less to charge per flight hour and have a maximum range of up to 815 kilometers (440 nautical miles). Alice will operate in all environments currently serviced by piston and turbine aircraft. Alice's advanced electric motors have fewer moving parts to increase reliability and reduce maintenance costs. Its operating software constantly monitors flight performance to ensure optimal efficiency.

“From day one, we set an audacious goal to transform the aviation industry and create a new era with electric aircraft,” said Eviation CEO Omer Bar-Yohay. “Partnering with companies like DHL who are the leaders in sustainable e-cargo transportation is a testament that the electric era is upon us. This announcement is a significant milestone on our quest to transform the future of flight across the globe.”

The aircraft is ideal for feeder routes and requires less investment in station infrastructure. Alice can be charged while loading and unloading operations occur, ensuring quick turnaround times that maintain DHL Express' tight schedules.

“My compliments to Eviation on the innovative development of the fully electric Alice aircraft,” says Travis Cobb, EVP Global Network Operations and Aviation for DHL Express. “With Alice's range and capacity, this is a fantastic sustainable solution for our global network. Our aspiration is to make a substantial contribution in reducing our carbon footprint, and these advancements in fleet and technology will go a long way in achieving further carbon reductions. For us and our customers, this is a very important step in our decarbonisation journey and a step forward for the aviation industry as a whole.”

★ www.dhl.com





WATER

ARE AUTONOMOUS RIVER VESSELS THE FUTURE OF WATER FREIGHT?

A government-backed collaboration between Cory and BAE Systems announced in September 2021 promises to design, develop and demonstrate technologies for the reduction of emissions from marine vessels.

As part of the Department for Transport (DfT) and Innovate UK's Maritime Demonstration Competition, the study will consider river-based cargo vessels as a use case for low and zero emission technology with autonomous capabilities.

Beginning in September as a feasibility study, the project will explore a wide range of technologies, including vessel propulsion and systems, on-vessel power generation, low carbon storage, port and shore side solutions and autonomous smart shipping technologies. The feasibility study is due to be completed by March 2022 with the aim of producing a clear path towards demonstrable technologies.

"Cory's collaboration with BAE Systems is an important, coordinated effort to reduce shipping emissions and explore the potential of autonomous propulsion," said Fran Comerford-Cole, Cory's Director of Logistics, "As a business, we are proud of our stewardship of the Thames and the river's role in reducing the environmental impact of our operations. We want to take this a step further by helping to drive innovation in lower and zero carbon marine vessels. In turn, this will help the UK on its road – or voyage – to net zero."

Paul Simavari, Business Development Manager at BAE Systems, Marine Europe said: "We're excited to collaborate with Cory on this project which will move the maritime sector forwards on the journey to Get to Zero. Cory's experience of reducing harmful carbon emissions, combined with our expertise in low and zero emission electric propulsion, power management and vessel autonomy, will help develop innovative solutions to ensure that we are firmly on the pathway to net zero carbon."

Cory recently announced that it had switched its fleet of tugs to run on hydrotreated vegetable oil (HVO), a biofuel. The move followed successful trials that resulted in a reduction of net carbon dioxide emissions by 90%. Regarding the move, Cory's CEO, Dougie Sutherland, said: "While we know this is a great step forward, we also recognise that using HVO is a temporary measure on the road to net zero, and that is why we are also exploring opportunities for zero carbon marine vessels."

Cory has been operating on the River Thames since the company's incorporation 125 years ago in 1896. The current fleet of tugs is responsible for transporting more than one million tonnes of recyclable and non-recyclable waste per year. Cory's use of the river to transport waste is unique in the UK and saves 100,000 truck movements annually, helping to keep roads safer, cleaner, and less congested.

★ www.corygroup.co.uk





RAIL

KEEPING LOGISTICS ON TRACK FOR TWO DECADES

Malcolm Rail celebrated 20 years in rail freight earlier this year, operating its first freight train service on 14 February 2001. The company now operates daily services 364 days of the year, carrying over 30,000 containers for a wide range of retailers and manufacturers.

Back in 2001, its first train left Grangemouth for the rail terminal at DIRFT (Daventry International Rail Freight Terminal). Operated by Direct Rail Services the train carried glass from Alloa to be used for lager and coffee jars. The northbound train returned the next day with petfood, pallets and some retail traffic.

In 2008, Malcolm Rail took over the operation of the rail terminal at DIRFT, a venture in which Clark and Holwell, supported by the Board, played an integral part in the team which successfully negotiated with Prologis to close this deal. The development of rail terminal operations had been a major part in Malcolm Rail's investment and development strategy over the past 15 years.

In 2014, the company's rail provider changed from DRS to DB Cargo UK. This successful partnership has already been extended several times and has led to their trains being hauled by electric traction, including their liveried loco 90024.

The 50-foot box was also launched and was a game changer. Her Royal Highness, The Princess Royal officially launched Malcolm Logistics' 50ft Container at the Multimodal exhibition in Birmingham's NEC. Witnessed by professionals from all areas of the industry, Malcolm Logistics was proud to unveil its newest intermodal innovation, which was set to revolutionise the way goods would be moved in the future.

The Malcolm Group has been actively developing rail-based freight movements for the last 20 years. During that time, it has moved around 700,000 containers taking 230,000,000 miles off the UK road networks. The customer base has grown significantly with multiple retailers and supermarkets now transporting goods by rail. Some retailers are choosing to promote their use of rail in their branding, and with growing focus on decarbonisation, Malcolm's looks to grow its rail operation going forward. DIRFT has also expanded significantly. The second phase completed in 2015 and its third phase is currently in development.

These trains are not only getting lorries off the road – each train is up to half a mile long, taking up to 80 HGVs from the road network – but they get goods to and from market efficiently and effectively. The northbound services bring retail products from national distribution centres in the midlands; the southbound flows are still all about exporting Scotland's local produce, be that mineral water, food and drink, or chipboard.

The trains are also helping Scotland decarbonise its economy. On average, rail freight makes only 25% of the carbon of HGVs, and where it can use electric haulage, as most of these trains do, the performance is even better. Around 45% of all rail freight in Scotland is electric, far better than the UK national average which sits around 12%.



★ www.malcolmgroup.co.uk



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