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COMPANIES

SMART
Are EVs affordable? The factors that drive up their cost

BIFFA AND LUNAZ
Exemplifying EV fleet partnership opportunity

LOTUS

LEAVING THE TRACK WITH THE EMEYA ELECTRIC HYPER-GT

Inspired by the company's deep sports car heritage, Lotus released its very own ***hyper-GT*** to propel the brand into a new era of driving anywhere, ***anytime***


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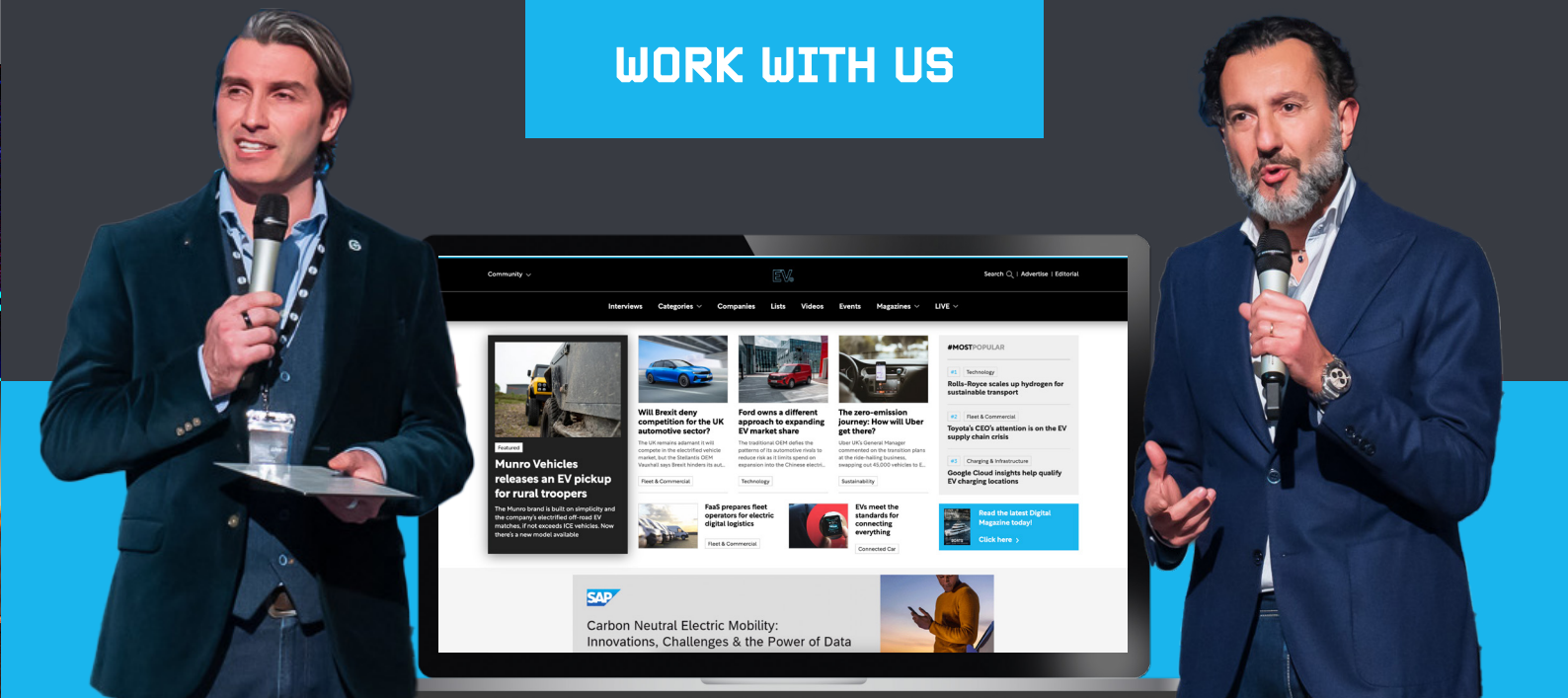

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WELCOME

A BLIP IN EV PROGRESS?

The latest EV-related isn't quite as positive as expected. Efforts to decarbonise the automotive sector catalysed a major growth spurt for those manufacturing electric cars, but it seems that, as the winter is soon to roll around, their EV strategies go into hibernation. Ford has cut back on its investments, General Motors on its targets, and Volkswagen Group cut the plans for its new factory altogether.

There seem to be numerous factors at play here. There are still concerns of all-electric vehicle range capabilities, charging networks are growing; not fast enough to draw in more drivers, and the cost of minerals, batteries, shortages of semiconductors; generally supply chain-related problems are all felt in the pockets of drivers and business owners.

It's not all negative. The seniors of EV world remain satisfied with their EVs and continue to evangelise the benefits, but the cost of shifting isn't yet great enough for everyone.

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NOV 2023

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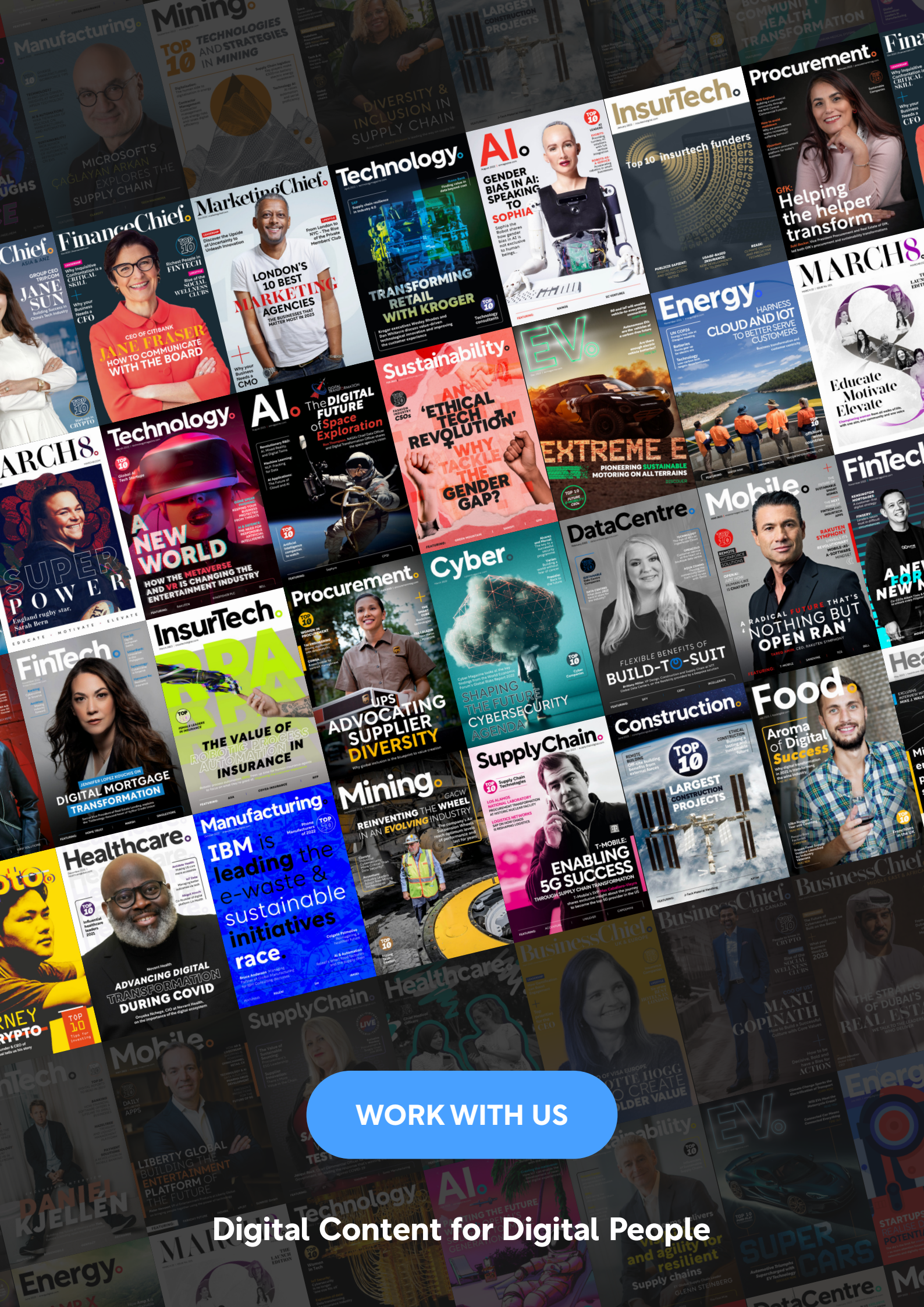

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LOTUS LEAVES THE TRACK WITH TH EMEYA ELECTRI HYPER-GT

Inspired by the company's deep sports car heritage, Lotus released its very own ***hyper-GT*** to propel the brand into a new era of driving anywhere, anytime

The Lotus Emeya represents a bold step into the future of electric performance by a company steeped in a rich history of sports car manufacturing. Lotus's foray into hyper-GT territory, the Emeya is a testament to the blend of style, performance, and technology that Lotus brings to the automotive sector.

The Emeya is built with a top specification model that boasts a high-power dual-motor set-up. We expert the powertrain to deliver impressive top speeds, making it incredible as a high-performance EV – similar to its supercar sister, the Evija. Although specific figures regarding its power, acceleration, and charging have not been entirely disclosed, it is evident from the snippets available that the Emeya is set to compete with the best in the electric hyper-GT segment. Lotus advertises the vehicle with a top speed of 159 mph and a 0-62 mph acceleration in just 2.8 seconds.

Interestingly, the Emeya shows close resemblance in specifications to its bigger SUV sibling – not to mention its aesthetic. This suggests that Lotus is emphasising versatility across its electric vehicle lineup, offering high-end performance in both its sports car and SUV formats. The company has also made a bold statement in shifting away from its relatively small sports car configurations.

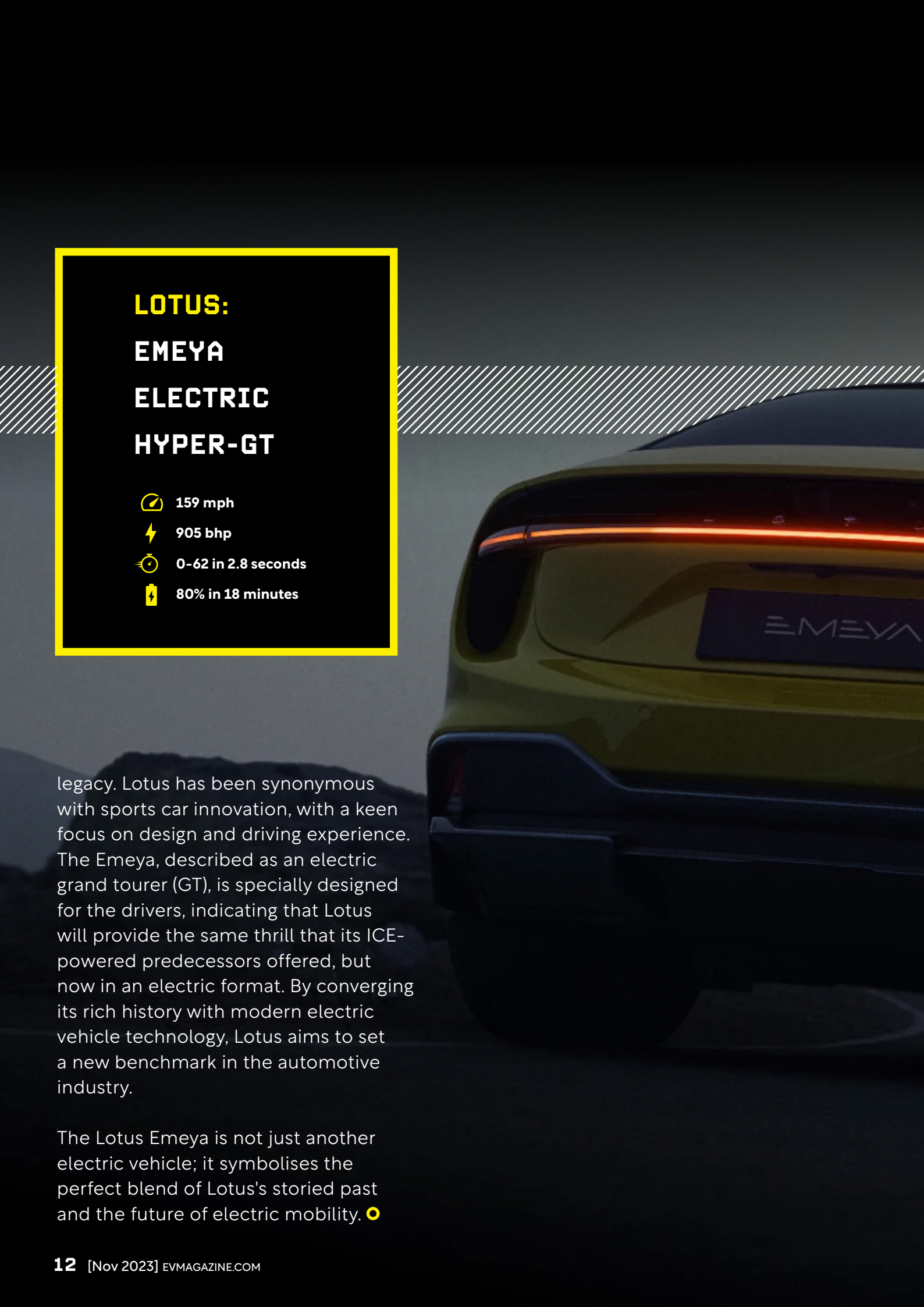
The inspiration behind the Emeya, and Lotus's venture into the electric hyper-GT category, is deeply rooted in the brand's

E

EC

LOTUS: EMEYA ELECTRIC HYPER-GT

- 159 mph
- 905 bhp
- 0-62 in 2.8 seconds
- 80% in 18 minutes



legacy. Lotus has been synonymous with sports car innovation, with a keen focus on design and driving experience. The Emeya, described as an electric grand tourer (GT), is specially designed for the drivers, indicating that Lotus will provide the same thrill that its ICE-powered predecessors offered, but now in an electric format. By converging its rich history with modern electric vehicle technology, Lotus aims to set a new benchmark in the automotive industry.

The Lotus Emeya is not just another electric vehicle; it symbolises the perfect blend of Lotus's storied past and the future of electric mobility.

GENERAL MOTORS' LEADING FORCE IN ELECTRIFICATION

Influential for a number of reasons, ***Mary Barra*** champions the great work of ***General Motors*** with more than four decades of female leadership and EV

When you think of ground-breaking, influential leaders in the automotive industry, a particular role model springs to mind. Mary Barra's name resonates across a few different areas as she champions her role as a female executive in a male-dominated industry, has worked through the ranks and showed her loyalty to the cause, and advocates a sustainable approach to automotive.

As the CEO and Chair of General Motors (GM), Barra has not only shattered the glass ceiling but has also been an influential voice in the automotive sector, particularly in the area of EVs.

FROM HUMBLE BEGINNINGS TO THE PINNACLE OF SUCCESS

Barra's story is one of steady ascent, marked by dedication and diligence. She joined GM at the age of 18, and her journey from that point has been nothing short of perseverance and dedication.

Rising through the ranks, Barra has worn many hats within the organisation, including her significant role as the Executive VP of Global Product Development before being named CEO in 2013 – then taking the Chair in 2016. She was 51 years old at that time and stated that she was "honoured to lead the best team in the business". Her tenure at GM has now spanned over four decades, making her a stalwart in the industry with deep-seated knowledge and expertise.

STEERING THE AUTOMOTIVE INDUSTRY TOWARDS A SUSTAINABLE FUTURE

When it comes to EVs, Barra steered General Motors to be at the forefront of innovation and sustainability – maintaining its reign in the automotive sector.

MARY BARRA

TITLE: CHAIR & CEO & PUBLIC AFFAIRS

COMPANY: GENERAL MOTORS

INDUSTRY: AUTOMOTIVE

LOCATION: UNITED STATES

Mary Barra is an American businesswoman born on December 24, 1961. She has been serving as the CEO and Chair of General Motors since 2014. Barra is the first woman to lead one of the big three U.S. automakers. She has made significant investments in electric vehicles and self-driving technologies.

"THE GENERAL MOTORS TEAM IS DOING OUTSTANDING WORK TO CREATE A SAFER, BETTER WORLD. IT IS A PRIVILEGE TO LEAD A COMPANY OF PURPOSE-DRIVEN PEOPLE WHO ARE DETERMINED TO MAKE A DIFFERENCE"

She believes that GM is "uniquely positioned to lead the EV" market, thanks to the company's advanced manufacturing capabilities and a highly trained workforce. Under her leadership, GM has made significant investments in electric and autonomous vehicles, putting the automaker on the map as a dominant player in the transition towards greener, more sustainable forms of transportation. Her influence is felt not just within GM but across the sector as a whole, inspiring other companies to ramp up their EV initiatives.

A TRAILBLAZER IN A MALE-DOMINATED REALM

Barra's leadership transcends the industry's technicalities; it has sociocultural implications as well.

Perhaps the most powerful, influential female leader in the automotive industry, she serves as a beacon for gender diversity, equity and inclusion. Often recognised as the first female CEO in the sector, her leadership skills made it evident that expertise and capability should be the measures for leadership roles, not gender.

By breaking through the barriers of a male-dominated industry, Barra paved the way for further female contribution to the auto industry, proving that, with the right skills and dedication, there are no limits to what one can achieve.

Barra's indomitable spirit and leadership allowed her to carve a niche in an industry that has long been dominating male leadership. Her career at General Motors is a testament to her unmatched abilities, both in strategic foresight and in executing visions for a more sustainable future. Not just a leader at GM, Barra has emerged as an icon for all genders and an important figure for all employees at the company, having redefined the scope and direction of the automotive industry while setting an inspiring precedent for DEI across all roles.

THE YEAR'S EV EXECUTIVE SHIFTS DRIVING ELECTRIFICATION

Set to influence further electrification, we bring you the most recent executive moves from the EV sector with consideration for key events in 2023

"HAVING WORKED EXTREMELY CLOSELY WITH PETER OVER THE PAST FIVE YEARS, IT WAS A PRIVILEGE TO CALL HIM A FRIEND AND GREAT MENTOR IN SHAPING GLOBAL CREATIVE LEADERSHIP AND INFLUENCING MY OWN DESIGN PHILOSOPHY"

BEN PAYNE
VICE PRESIDENT OF DESIGN
LOTUS

BEN PAYNE

JOB FROM: CHIEF CREATIVE OFFICER - LOTUS
JOB TO: VICE PRESIDENT OF DESIGN - LOTUS

The newly appointed Vice President of Design at Lotus Ben Payne takes on the position from its previous holder Peter Horbury who passed away in June 2023. Having worked closely with Horbury, Payne feels a great sense of privilege to be taking his mantle. Payne most recently worked on the team that designed the much-anticipated Lotus Eletre, which was the first all-electric to make it to the delivery stage and one of a trio of EVs that will electrify the company's automotive lineup.

Payne has only worked with Lotus since February 2022, but previously worked under its parent organisation GEELY as its Managing Director and Head of its Studio for automotive design.

VINCENZO REGAZZONI

JOB FROM: EXECUTIVE MANUFACTURING ADVISOR - REGAZZONI & PARTNERS CONSULTING
JOB TO: CHIEF INDUSTRIAL OFFICER - ASTON MARTIN

Earlier this year, Aston Martin snapped up the previous Chief Manufacturing Officer of Ferrari. Vincenzo Regazzoni left the organisation in 2022 to become a consultant in the manufacturing field, but has recently returned to an automotive brand.

LILY COLES

JOB FROM: NEW ENERGY DIRECTOR - SMS PLC
JOB TO: HUB DEVELOPMENT DIRECTOR - INSTAVOLT

A slight recap of the year, Lily Cole shifted to InstaVolt in July 2023 to share her 15+ years of energy industry expertise with the organisation.

CHARLES SANDERSON

JOB FROM: CHIEF ENGINEER - RIVIAN
JOB TO: CHIEF TECHNICAL OFFICER- MCLAREN AUTOMOTIVE

Returning to the supercar company's team in March, after a nearly-five-year stint at Rivian as its Chief Engineer, Sanderson is now McLaren Automotive's Chief Technical Officer.

KOJI SATO

JOB FROM: CHIEF BRANDING OFFICER & OPERATING OFFICER - TOYOTA
JOB TO: CHIEF EXECUTIVE OFFICER, MEMBER OF THE BOARD OF DIRECTORS, PRESIDENT & OPERATING OFFICER - TOYOTA

Bringing a new lease of life to the Toyota brand, Koji Sato took the helm in April 2023 as the new CEO of the company to replace Akio Toyoda.

DAVID WOOLLEY

JOB FROM: CHIEF EXECUTIVE OFFICER - VIE KAPITAL AB
JOB TO: CHIEF EXECUTIVE OFFICER - SAIETTA

Saietta is a UK-based firm developing a number of electric drive systems for a variety of EV applications. These include electric boats, buses, trucks, cars, quadricycles, bikes, and scooters.

BEN PAYNE

VICE PRESIDENT OF DESIGN
LOTUS

TECHNOLOGY BRINGING MORE EVs TO MARKET

EV Magazine's top picks of past stories from November to November 2023, covering technology, new electric cars, green initiatives, and events

TESLA IS STREAMLINING STAGES OF ELECTRIC VEHICLE PRODUCTION

Day one of Sustainability LIVE 2023 was as diverse as the industries that it impacts. Speaking to a number of the guest speakers at the event, many of them are keen to share their thoughts, influence businesses, and raise awareness of the impacts that businesses can have on environmental, social

READ NOW »

ELECTRIC VEHICLE ADVOCATES JOIN SUSTAINABILITY LIVE 2023

Day one of Sustainability LIVE 2023 was as diverse as the industries that it impacts. Speaking to a number of the guest speakers at the event, many of them are keen to share their thoughts, influence businesses, and raise awareness of the impacts that businesses can have on environmental, social and governance (ESG).

READ NOW »

TOP 10: EV TECHNOLOGY COMPANIES

The automotive sector has become a breeding ground for new and innovative electric vehicle (EV) technologies, as well as those further applied to other industry areas. Recognising the demand for digital transformation in this space, the following 10 businesses have developed solutions that will pave the way for increased EV usage and mobility of the future.

READ NOW »

LOTUS' ELECTRIC VEHICLE TRANSFORMATION TAKES A NEW TURN

On the 7th September 2023, Lotus then showcased the final of its electric trio, the Emeya – an all-electric grand tourer designed for true drivers.

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LAMBORGHINI LAUNCHES THE LANZADOR AS ITS FIRST CONCEPT EV

The electric vehicle is planned for 2028, indicating a visionary preview into the future of the luxury car brand. The launch is inline with the brand's 2021 Direzione Cor Tauri strategy, and marks a significant step towards decarbonisation and electrification.

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POLESTAR PREMIUM EVS SUPPORT US GREEN TRANSPORT TRANSITION

Data from the US Department of Energy suggests that many of the United States are yet to accelerate their transition to all-electric vehicles.

READ NOW »

POD POINT'S WHIRLWIND JOURNEY IN THE EV CHARGING SECTOR

James McKemey, Head of Policy & Public Affairs at Pod Point, shares details of the company's journey and the challenges ahead for EV charging

The EV charging landscape is one of growth and with new organisations coming into the fold over the years, more recent emphasis on the infrastructure that powers electric cars has driven that growth further.

Organisations navigated some of the biggest industry challenges over the past few years, including the global pandemic and market pressures, yet electrification still progresses and more and more are coming around to the idea of an entirely electricity-powered transport network somewhere in the future.

First came the EV, then came the infrastructure to support it – the former evolving rapidly and leaving charging businesses to catch up in order for electrification to seem likely.

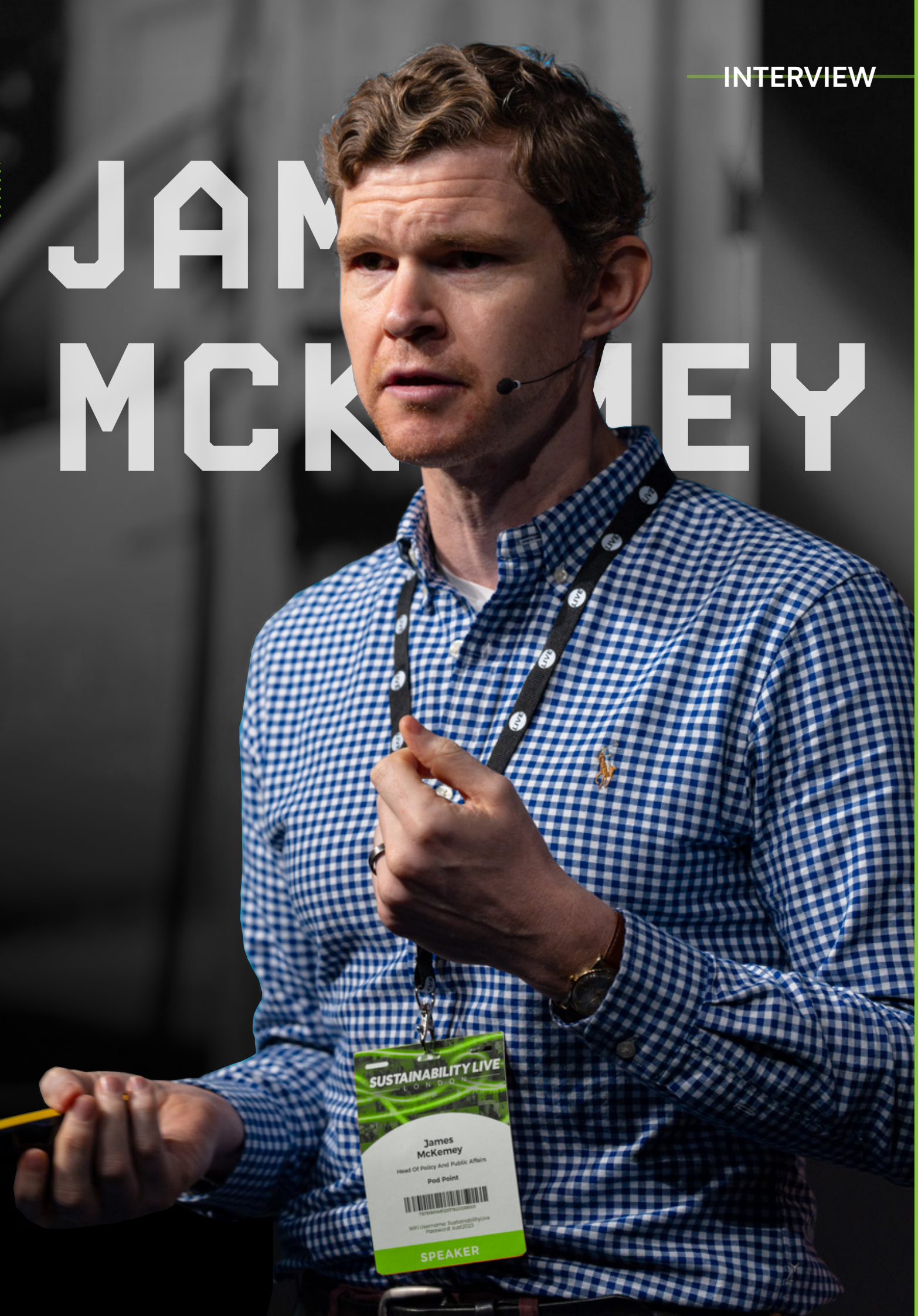
Catching up with one of Sustainability LIVE London's great speakers, we're keen to find out what makes a successful EV charging business. Who better to speak to than the Head of Policy & Public Affairs of one of the UK's ultimate charging providers Pod Point. James McKemey answered some questions about the company, its journey since its founding in 2009, and insights that will help further charging operators and product developers to deliver what the world's transport needs.

This conversation follows McKemey's keynote session at Sustainability LIVE London, 'Charging Up: The Road to 2030'.

EXPLAIN, IN A NUTSHELL, POD POINT'S GROWTH OVER THE PAST YEAR?

The past year or so has posed challenges including post-pandemic vehicle supply issues, inflationary pressures and cost of living crisis – particularly the dramatic spike in the cost of electricity. However, we are pleased with progress made so far this year which included several high-profile contract

JAM MCK EY


SUSTAINABILITY LIVE
LONDON
James
McKemey
Head Of Policy And Public Affairs
Pod Point
SPEAKER

wins with large UK housebuilders (Barratt's and Redrow) and, in particular, the launch of our new Grid Business Unit. Alongside helping customers reduce costs and carbon emissions, the Grid business unit will be developing recurring revenue streams from across Pod Point's growing network of over 212,000 connected charge points – which remains by far the largest in the UK. We also signed our first commercial grid load management agreement and experienced significant improvements in our supply chain operations and an increase in our recurring revenues.

WHAT ROLE DID DISRUPTION PLAY IN THE SUCCESS OF EVs AND, IN TURN, POD POINT?

Ultimately the EV is a disruptive technology, a better car, a more convenient way of using them (top up charging at your destination vs making trips to refuel), that will disrupt the supremacy of the fossil fuel industry in the coming decades. With the fortunes of the charging sector inextricably linked to the fortunes of the EV, we expect Pod Point's success will continue to track the success of the EV.

JAMES MCKEMEY

TITLE: HEAD OF POLICY & PUBLIC AFFAIRS
COMPANY: POD POINT
INDUSTRY: EV CHARGING
LOCATION: UNITED KINGDOM

McKemey has a crucial role to play in delivering sustainability electric car charging solutions. He specialises in environmental and sustainability assessment with a key focus on BREEAM to inform Pod Point's decisions on how best to move forward with charger roll out and distribution.

WHAT IS THE BIGGEST CHALLENGE FOR EV USERS – PUBLIC CHARGING OR AT-HOME CHARGING?

Home charging is the most convenient, and usually the most affordable way to charge an EV. Up to 72% of drivers have access to off-street parking at home that will enable most to charge overnight.

For those who can't charge at home, many will charge very easily at their workplaces, but there are those who will be solely reliant on public charging. There is no single solution, it will be a mix of widespread destination charging, potentially on-street charging and maybe some more regular use of high-powered charging. Either way there is still a lot of work to do to build the charging infrastructure we'll need to support the mass uptake of electric cars over the next decade, but that work is well underway.

Pod Point's public network is one of the largest and most used in the UK. Our strategy is to work with commercial partners to fit charging infrastructure into their existing, popular locations, which drivers naturally visit anyway (e.g. supermarkets, station car parks, gyms etc). This has been a success and has proven popular with EV drivers.

WHAT ARE THE ECONOMIC BENEFITS TO DRIVERS THROUGH EVS FROM A CHARGING PERSPECTIVE?

Charging an electric car at home is the most convenient and cost-effective way to keep your car fully charged, costing about £17 for a full charge and providing about 200 miles of range. Most drivers will charge their electric car overnight, waking up to a full battery every morning. By switching to a dual-rate electricity tariff designed specifically for EV drivers you could reduce this even further. But it is possible to save money charging in public, versus filling with petrol, with competitive tariffs found on numerous public charging networks.

As well as the "fuel" cost savings, EVs have vastly fewer moving parts and thus have substantially reduced maintenance requirements. EVs have no clutches, exhausts, cam belts, timing belts, head gaskets, etc etc. These reduced requirements mean reduced operating costs.

HOW IS POD POINT LEVERAGING DIGITAL TO CREATE MORE CONVENIENCE FOR EV USERS?

We recently integrated our Pod Point App to the National Grid Carbon Intensity forecast so as to indicate to EV drivers the optimal times to charge to reduce the carbon footprint of their charging, and thus driving.

The success of the Grid Business Unit will depend wholly on leveraging digital capabilities of our charging network to meet the requirements of demand side response markets of different kinds.

"AS WELL AS THE "FUEL" COST SAVINGS, EVs HAVE VASTLY FEWER MOVING PARTS AND THUS HAVE SUBSTANTIALLY REDUCED MAINTENANCE REQUIREMENTS"

ONE OF THE UK ORIGINAL CHARGING PROVIDERS

Pod Point, established in 2009, is one of the pioneering companies in the UK's EV charging sector.

Recognised for its commitment to creating a sustainable future, Pod Point provides both home and public charging solutions for EV users. Its innovative infrastructure has helped drive the transition to electric mobility, making EV charging more accessible and user-friendly.

Pod Point's ethos revolves around the idea that travel shouldn't damage the earth, leading them to create a network that has facilitated millions of miles of emission-free driving. As EVs become the norm, Pod Point's role in revolutionising transport infrastructure remains commendable.

HOW DO YOU EXPECT THE CHARGING LANDSCAPE TO EVOLVE IN THE COMING YEARS?

With the need to move to zero emissions, EVs are going to win. Even without the 2035 ban, they're the best cars we've developed and will soon be cheaper to make and drive than ICE cars. We're going to need to install a lot of EV charging infrastructure. While the exact proportions across the charging ecosystem may be unclear, we will definitely require millions of home and work chargers, hundreds of thousands of destination chargers, and thousands of en route chargers. With so much scale to come, the future outlook for EV charging infrastructure is undeniably bright.

HOW WILL POD POINT RESPOND TO THOSE TRENDS?

Pod Point will continue to focus on the needs of EV drivers, aiming to make living with an EV as easy as possible.


SUSTAINABILITY LIVE
James
McKamey
SPEAKER

TOP 10 ELECTRIC MOTORCYCLE COMPANIES

EV Magazine takes a look at the most influential businesses in terms of ***electric motorcycle innovation*** and advocacy for climate-compliant thrill seeking

Focusing on both innovation and influence. We want to know that the most influential motorcycle makers can also provide ingenious new examples of all-electric motoring. From intuitive riding to the longest range and best performance, the businesses have delivered continuously to allow the industry to evolve with the times, and generate new waves of interest in the process.

The Top 10 Electric Motorcycle Companies are the saviours of the sector that is made of thrill-seekers, night-riders, commuters, and much more.

#10

KAWASAKI

The much-loved motorcycle brand released its first showcases of EV performance in August 2023 with the Ninja e-1 and the Z e-1 electric motorcycles making a splash in industry news.

These vehicles are built incredibly light with the Ninja e-1 expected to be just 140 kg while the Z e-1 is even lighter at 135 kg. The company also joined up with industry powers Honda , Suzuki and Yamaha to create Gachaco – a battery swapping business that will serve motorcycle riders.

#09

DUCATI

The partner of choice for the MotoE World Championship and a veteran in the sport bike space. The team was drafted to build the next MotoE vehicle, which we can expect is a testament to its plans for electrification of its consumer product line.

Since this featured in the first ever edition of EV Magazine, we've seen great progress in the development of the motorcycle and we expect this will also champion many more achievements in terms of charging performance.

#08

BMW MOTORRAD

Slightly controversial in this group, the BMW Motorrad business delivers the CE 04, which looks somewhat like a moped. While this doesn't compromise on power and performance for a city rider, it does beg the question – where is the line between moped and motorbike?

Nevertheless, BMW's motorcycle arm delivers a great commuter that is suitable for the idea of micro-mobility in cities. For riders that neither have space nor the inclination to ride for long distances, the BMW has them covered.

LSX II – The Definitive Compact Wireless HiFi

Welcome to a world of High-Fidelity sound that is true enough to touch. Designed by Michael Young in collaboration with KEF, the all-in-one speaker system LSX II is upgraded with the W2 wireless platform and enhanced DSP algorithm in the Music Integrity Engine to deliver a more balanced sound while updating usability with the KEF Connect App for ease of use. Play anything with all-inclusive connectivity.

AirPlay 2, Chromecast, Spotify, Tidal, MQA, HDMI and more.

Listen and believe KEF 60 YEARS

#07

VERGE

A startup that has appeared only recently, Verge Motorcycles has an entirely unique, revolutionary approach to electric motorcycle development. Its unseen architecture is set to deliver exceptional performance and ride while also reducing the level of maintenance required to keep the motorbike at its best.

You've only got to look at the sheer ludicrous design of the Verge TS models to visualise how the company will make an impact in years to come.

#06

TRIUMPH

Launching its first all-electric motorcycle prototype to the public at the end of 2021, Triumph shares a similar path to its fossil-fuel-derived competitors, but still has far to go to offer a fully electric motorcycle range.

Now in phase 4 of development, the Triumph TE-1 achieves a maximum range of 100 miles with peak power of 175 horsepower. In terms of charging, it only takes 20 minutes for the TE-1 to charge from 0-80%, which is faster than many others on the market.

#05

DAMON

Electric motorcycles by Damon are all about ingenuity. Not only is there a performance boost from its HyperDrive integrated system, but the company is paying attention to what riders want by creating adjustable bikes that mechanically shift to meet the needs of the rider.

Something of a futuristic style ride, the Hypersport is one of its vehicles fitted with its 360-degree CoPilot, but also leverages shifting handlebars and foot pedals to put the ride in the correct position for the speed.

#04

ARC

The longest-range electric motorcycle we've seen so far comes from Arc. With a charging time of 40 minutes for its Vector model and a weight of just 240 kg, range is capable of reaching 435 km or 270 miles.

The Vector is one of a very interesting lineup of vehicles as the company has recently released the design of a four-wheel off-road car alongside its two street bikes and a dual sport.

#03

HARLEY DAVIDSON LIVEWIRE

The iconic motorcycle brand is very much committed to electrification. Its acceptance of the challenge is marked by its branding with a new business ‘LiveWire’ delivering motorcycle enthusiasts with new and innovative electric motorbikes.

It seems that, through the new brand, Harley Davidson is focused on what’s important – providing the same great Harley experience in an electric format without compromising on power or comfort.

#2

ZERO

WATCH

Zero motorcycles is a great all-electric pick for the sheer breadth of motorbikes that it offers. The company is delivering a number of products to the market that meet the needs of the thrill seeker or the everyday user.

Not only has its electric architecture been influential in the industry, but it can also be applied to many different formats to offer a great variety of styles and functions to its customers. From streebikes to dual-sport models, Zero now has nine products in its range, each receiving new updates on the regular.

We see Zero as a great solution provider for a new era of mobility as more and more consumers shift micro-mobility for its conveniences and low impact. The accessory products offered by Zero make this process a much easier shift with comfort, power, and storage solutions.


ENERGICA
EXPERIA

#1

ENERGICA

WATCH

Aside from its name suiting the industry to a tee, Energica is responsible for developing some of the sector's best-performing motorcycles with top-tier range in both cities and on highways. The Energica Eva Ribelle and the Experia are among the longest-range motorbikes in the world and will even outperform a number of passenger cars with a fraction of the battery and charging requirements.

From touring to street and sports riding, Energica is built with high-energy lithium polymer batteries to enable those benefits along with DC fast charging compatibility.

The Energica Inside business unit is one of the youngest, but since 2022 it has delivered some amazing progress and supported motorsports with its motorcycles to built an entirely new structure to the industry, following he trends of other four-wheel racing championships.

ARE EVs AF

THE FACTORS THAT D

FORDABLE?

RIVE UP THEIR COST

Commenting on affordability, the ***CEO of Smart UK David Browne*** addresses the high costs of electric vehicles, spurred by the value of EV batteries

With all the discussions about new and innovative EVs there's a particular emphasis on the latest technologies, premium quality, vehicle range, but we've not yet had the discussion about affordability.

Thanks to the incredibly high cost of EV batteries due to the short supply of critical resources, the price of purchasing an electric car compared to an internal combustion engine (ICE) model is relatively high. This leads us into the question of affordability. What defines an affordable EV? What are the reasons for high EV prices? How will the industry overcome this challenge?

As usual, we speak to the industry to find our answers and, in talking to experts from the automotive sector, we learn a lot about the current changings in this landscape and how they will adapt to meet the growing demand for affordable passenger cars.

David Browne (DB), CEO of Smart UK, commented on what affordability really means and how this is impacted by the supply chain.

TS: What defines affordability in the world of EVs?

DB: Absolute price is of course still the key metric that an EV's affordability will be judged by, but total cost of ownership

is incredibly significant. With the majority of people paying for their car monthly, it's important to look at overall expenditure - including maintenance, consumables, fuel, tax, and any applicable emissions charges - when evaluating how affordable running an EV can be versus an ICE equivalent with a lower monthly payment.

Ascertaining whether you'll be able to charge at home - perhaps even from your own renewable sources such as rooftop solar - rather than from more costly public fast chargers, can also have a big impact on perceived affordability in the long term.

TS: Why are EVs still much more costly than ICE vehicles in terms of retail price?

DB: I think this perception is still skewed by the fact that many early EVs have been deliberately positioned at the top end of the market, irrespective of powertrain, which gives the impression of a high entry price overall.

I would say that this gap is closing all the time as more manufacturers launch products which naturally sit lower in the price range. The important thing to remember is that many EVs are very well equipped in terms of specification and performance. If you take this into account then there are already clear examples of EVs which actually cost very little more than, or are even at parity with, equivalent ICE cars.

TS: What are some of the key attributes that consumers look for in affordable EVs?

DB: EVs are often more closely associated with being technologically advanced than

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"EVs ARE OFTEN MORE CLOSELY ASSOCIATED WITH BEING TECHNOLOGICALLY ADVANCED THAN ICE CARS"

DAVID BROWNE,
CEO, SMART UK

ICE cars, meaning that consumers still look for a high level of tech, even in more affordable models.

Practicality – both in terms of the additional space offered by an EV platform, and a usable range and fast charging speed - is also high on peoples' lists, while the well-known torque delivery of EV motors means excellent off-the-line performance has come to be expected as a given.

TS: How can car makers make their vehicles more affordable with consideration for the high cost of batteries?

Rightsizing the battery and improving overall efficiency for the car as a whole are both important here. There are a number of manufacturers throwing very large batteries at the problem of range anxiety, but customers would often be better served by being educated about the benefits of choosing an appropriate battery capacity for their needs.

A smaller, lighter battery can offer improved driving characteristics and better charging speed across the range of charging types, for example 22kW AC, while also reducing the overall cost of the vehicle. For many drivers this would still offer them more than enough range for the majority of their journeys, while fitting more easily into their lifestyle and budget.

"ABSOLUTE PRICE IS OF COURSE STILL THE KEY METRIC THAT AN EV'S AFFORDABILITY WILL BE JUDGED BY"

DAVID BROWNE,
CEO, SMART UK

KEY TAKEAWAYS FROM THIS CONVERSATION

The EV landscape is rapidly evolving, but challenging conventional metrics of affordability. While the initial price tag remains a paramount concern for the majority, a more nuanced understanding of cost emerges considering the total cost of ownership – encompassing everything from maintenance to emissions charges. For many, monthly expenses and the possibility of home charging – potentially from renewable sources – paint a clearer picture of long-term affordability.

EVs are seen to be more costly than their ICE counterparts. This perception is rooted in the early positioning of EVs as luxury commodities. However, as the market expands, this gap is consistently narrowing. Many modern EVs, armed with top-tier specifications, are now competitively priced alongside, if not better than, comparable ICE vehicles.

Consumers' expectations from affordable EVs have also evolved. Beyond just being cost-effective, they demand advanced tech, space, substantial range, rapid charging, and the hallmark torque–driven acceleration of EVs.

Addressing the elephant in the room–battery costs–manufacturers can realign strategies. Rightsizing batteries, rather than super-sizing them, can address both range concerns and cost challenges. Education plays a pivotal role: informing consumers about optimal battery choices can lead to better driving experiences without unnecessary premiums.


LUNAZ
UEV
Biffa
LUNAZ

BIFFA AND LUNAZ

EXEMPLIFY EV FLEET PARTNERSHIP OPPORTUNITY

Speaking with the Head of Fleet Development at Biffa ***Darren Judd,*** he explains partnerships are crucial in electrification and the opportunities presented

In September 2023, we covered the story of the waste management company Biffa and its partnerships with Lunaz – a dedicated ICE to EV conversion business. Prior to this, we saw Lunaz's interesting ideas coming to life in the form of classic car models that have been built to match their original specification, minus their engines.

This wasn't a partnership that we were aware of until the announcement, but there is something to be said for this taking shape. Previous coverage suggested small startups will help the most established businesses enter their fleet into the electric era, and this has now been proven in a partnership to upcycle fuel-burning bin lorries.

So, why are partnerships so important to businesses as electrification comes around? Facing a number of new challenges across various industries, fleet operators are beginning to realise the benefits of employing the help of strategic partners to help them get to grips with new technologies to allow them to decarbonise. This is in line with the general trend over the past few years whereby organisations are less precious and are more open to the benefits that a variety of expertise can bring to their business.

> "THE FIRST AND MOST CRUCIAL STEP IS TO ASSESS THE TECHNOLOGY WITHIN THE VEHICLE TO ENSURE IT ALIGNS WITH OUR SPECIFIC NEEDS"
>
> DARREN JUDD, HEAD OF FLEET DEVELOPMENT, BIFFA

All companies have to do is choose wisely. Companies life Biffa are lucky as they have fewer partnership opportunities to choose from, but generally, the choice of organisations within other areas must be rather overwhelming. Electrification as an industry is still growing and there are very few conversations about ICE conversion as there are talks of new fleet vehicles, managed fleets, and so on.

The EV sector opened up a lot of scope for businesses to stand out from the crowd, which aided Biffa in the partnership decision process.

CELEBRITY FOOTBALL STAR
DAVID BECKHAM VISITING
THE LUNAZ DESIGN SHOWROOM

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[1] These include the Verified Carbon Standard, Gold Standard, the American Carbon Registry and the Climate, Community and Biodiversity Standards or equivalent where possible.

SHELL FLEET SOLUTIONS

"A PARTNER NEEDS TO DEMONSTRATE ITS WILLINGNESS TO ENGAGE TO MAKE A POSITIVE DIFFERENCE, BUILT ON TRUST, SHARED GOALS AND MUTUAL GROWTH"

DARREN JUDD, HEAD OF FLEET DEVELOPMENT, BIFFA

"The first and most crucial step is to assess the technology within the vehicle to ensure it aligns with our specific needs, such as meeting the required battery life," says Darren Judd, Head of Fleet Development at Biffa.

"While there are numerous manufacturers in the market offering similar services, Lunaz set itself apart by going beyond mere motor replacement, delivering impressive quality and proven performance in trials. One thing that stood out among our team was the unique conversion process. Unlike some competitors who opt for dark interiors, Lunaz offers a brighter and more appealing interior which makes a difference when you're spending a lot of time in them."

TECHNOLOGICAL CHANGE CREATES UNORTHODOX PARTNERSHIPS

At the forefront of all changes in the EV sector is technology. Digital transformation is discussed a lot from a corporate standpoint, but is realistically evolving everywhere. Alongside the demand for consultants to guide businesses down the correct paths commercials, it's the technology providers that are able to drive them in those directions.

"OUR EV EXPERIENCE HAS INTRODUCED UNCONVENTIONAL PARTNERSHIP OPPORTUNITIES IN UNEXPECTED WAYS"

DARREN JUDD, HEAD OF FLEET DEVELOPMENT, BIFFA

As a result, companies are experiencing some unorthodox changes, particularly when the automotive sector is experiencing a major revolution in industrial systems and digital functions.

“Our EV experience has introduced unconventional partnership opportunities in unexpected ways. It prompted us to consider collaboration with electricity suppliers and other businesses for B2B charging solutions, something we never contemplated beforem: says Judd.

“For example, we're engaging with Distribution Network Operators (DNOs) to understand our electric capacity, addressing the challenge of charging commercial trucks. These discussions extend beyond charging to innovative ideas like taking lunch breaks at charging stations and using their facilities. We're exploring uncharted territories in B2B collaborations that were non-existent in the diesel world.”

With any electrification partnership, views must be aligned. Organisations thrive on the fact that companies in the industry are all dedicated to the same mission. Despite there being minimal alternative solution like Lunaz, Biffa still takes pride in being selective of its partner in this project. So, we asked Judd what the company looks for in a strategic partner.

“Firstly, a partner needs to demonstrate its willingness to engage to make a positive difference, built on trust, shared goals and mutual growth. We want to grow with each other and that is exactly what Lunaz has set out to achieve,” says Judd.

THE BIFFA-LUNAZ ICE CONVERSION PARTNERSHIP

Biffa entered into partnership with Lunaz Applied Technologies – a sister of its Lunaz Design business – to tackle the electrification challenge with the vehicles it already owns. The partners are taking a sustainable approach to this by leveraging ICE conversion to transform its combustion-powered bin lorries into electrified trucks.

This collaboration involves replacing the traditional diesel engines of Biffa’s trucks with electric power architecture to renew their lifespan, but also decarbonise them. Lunaz is known for designing electric propulsion systems for classic car models and has put these learnings into practice in a revolutionary feat of electrical engineering.

“They are extremely keen to listen to our advice, working collaboratively with our front-line operation team, being on hand to support in any way they can. It helps that the quality of their work is outstanding - our drivers have been extremely impressed with the vehicles and Lunaz has ensured they completely understand them as well.”

It’s to be expected that more innovative partnerships like this will appear in the industry. With much of the attention of passenger-electric cars, there is still a large number of alternative vehicles to source for industrial applications and the leisure and lifestyle sector. While EV growth is paramount, the industry is now able to shift its focus to more complex tasks, such as electrifying service vehicles and ensuring that necessary industries are decarbonised.

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LITHIUM TO SOLID-STATE: HAT WILL THIS EV VOLUTION BRING?

Lithium-ion is widely adopted among OEMs, but the desired battery performance can be found in the solid-state EV batteries to come in the future

There are three key factors encouraging developers to figure out what the next generation of electric vehicle (EV) power will look like. One is range, another cost, and the final one is supply.

The industry has been kept under tight reins as these factors have been held over its head for quite some time. EV range is slowly increasing, but there are promises of further growth there. In terms of cost, lithium-ion batteries just aren't able to keep up with demand, which is also a result of the last point – the limited supply of lithium for automotive use.

In the ever-evolving world of EVs, the race to develop more efficient, long-lasting, and safer batteries is a priority. The transition from liquid electrolytes in lithium-ion batteries to solid-state batteries (SSBs) is hailed as a potential game-changer. However, as the switch to SSBs seems imminent, industries are most likely hopeful for, yet vigilant of, change.

UNDERSTANDING SOLID-STATE BATTERIES

Commenting on this is one of the leading companies in the battery technology space. Choi Kyoung-hwan, Head of SK On Next Generation Battery R&D Office – and leading figure in the battery industry – helped us dive deeper into the progress and potential of SSBs as a solution to a number of electrification concerns for businesses and the everyday driver.

Kyoung-hwan paints an optimistic picture, noting, "The battery industry is advancing the development of all-solid-state technology, which is gaining significant attention as the next-generation battery." With SK On's recent announcement of a new oxide-based solid electrolyte with excellent lithium-ion conductivity, the horizon looks promising. "We expect that this breakthrough will expedite the commercialisation of all-solid-state batteries," adds Kyoung-hwan.

The company is also working on two distinct types of SSBs: high molecular/oxide-

based and the sulphide-based. SK On aims to introduce early-stage prototypes by 2026 and expects to commercialise them by 2028.

BENEFITS OF SOLID-STATE BATTERIES IN EVS

What makes solid-state batteries the next big thing for EVs? Kyoung-hwan succinctly puts it, "The potential gain is widespread EV adoption." Given their reputation for stability and efficiency, SSBs are well-positioned to promote EV adoption and strengthen automakers' EV portfolios.

APART FROM THEIR EFFICIENCY, KYOUNG-HWAN HIGHLIGHTS TWO PIVOTAL ADVANTAGES:

Safety: Traditional lithium-ion batteries (LiBs) use liquid electrolytes that are fire-prone. In contrast, SSBs employ solid electrolytes, dramatically reducing the risk of fires – a significant concern for the EV industry.

Performance under Extremes: SSBs outperform under challenging conditions, diminishing the need for additional cooling devices and battery management systems. "This enables an increase in the energy density of batteries in EVs, leading to reduced vehicle weight and improved driving range," Kyoung-hwan mentions. This improvement translates to extending the EV's driving time by enhancing charging capacity while simultaneously decreasing battery volume and weight.

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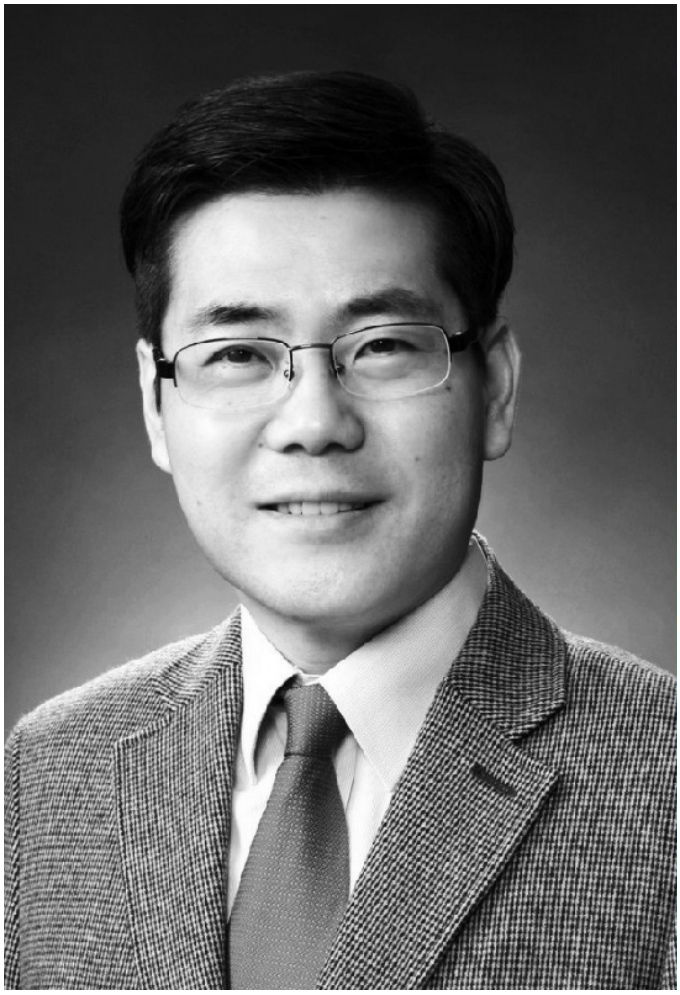

CHOI KYOUNG-HWAN

TITLE: HEAD OF SK ON NEXT GENERATION BATTERY R&D OFFICE

COMPANY: SK ON

INDUSTRY: TECHNOLOGY

LOCATION: SOUTH KOREA

Choi Kyung-hwan serves as the Vice President and Head of Next Generation Battery R&D Office at SK On. Boasting over two decades of experience in battery technology, he spearheads the company's endeavours in advancing next-generation batteries, notably SSB technology. Choi holds a doctoral degree from Yonsei University in chemical engineering.

"MAJOR OXIDE-BASED SOLID ELECTROLYTES CURRENTLY COMMAND PRICES OF AROUND US$1,000 PER KILOGRAMME"

CHOI KYOUNG-HWAN, HEAD OF NEXT GENERATION BATTERY R&D OFFICE, SK ON

THE IMPACT OF LITHIUM PRODUCTION DRIVES SSB RESEARCH

Aside from the technical advancements found in SSBs, there is more to the conversation in terms of sustainability. According to the International Energy Agency (IEA), shortages of lithium and cobalt could occur as early as 2025. Currently, the average electric car uses eight kilogrammes of lithium and, with a feasible 22 million tonnes of lithium, around 2.8 million cars can be produced – not to mention the impacts on the industry if it were to be the sole solution for EV batteries.

Much like the energy mix, automotive requires a multifaceted approach, which is where the idea of the SSB comes into play. There is also the option to deliver sodium-ion batteries (SIBs) – basically 'salt batteries' – as another option.

THE CHALLENGES AHEAD OF SSB RESEARCH AND DEVELOPMENT

Despite their promising potential, solid-state batteries aren't without challenges. The most evident hurdle, as Kyoung-hwan

mentions, is their high cost. "Major oxide-based solid electrolytes currently command prices of around US$1,000 per kilogram, while sulphide-based solid electrolytes are priced at approximately US$2,000," he says. However, he is hopeful, believing that "the industry is planning to enhance cost competitiveness through mass production and technological advancements."

Furthermore, Kyoung-hwan flags a significant safety concern with sulphide solid electrolytes. They can produce toxic hydrogen sulphide gas upon reacting with atmospheric moisture. "This issue is expected to be resolved by manufacturing batteries under moisture-free conditions or by developing materials that minimise moisture-related reactions when exposed to air," Kyoung-hwan assures.

Solid-state batteries are indeed seen as the silver bullet of electrification. But, Kyoung-hwan also cautions about the risks associated with them. While they offer better capacity than lithium-ion batteries, their successful entry into the EV market hinges on price competitiveness.

Moreover, if lithium-ion battery technology continues its upward trajectory in terms of safety enhancements, the advantages of SSBs might potentially be overshadowed.

The future of EVs is exciting, with innovations like solid-state batteries promising to redefine the landscape by enabling greater efficiencies and less environmental strain. However, as Kyoung-hwan's insights suggest, challenges lie ahead. Collaboration, innovation, and a focus on sustainable solutions will be key in driving the future of electrification.

SK ON: PUSHING THE LIMITS OF EV BATTERY TECH

SK On is at the forefront of reshaping the future of mobility, championing eco-friendly and convenient transportation alternatives. Through groundbreaking battery solutions, SK On plays a pivotal role in accelerating the transition to EVs. Their lithium-ion batteries, known for safety, are engineered for quicker charging and extended ranges.

Collaborating with international automotive giants, SK On's consistent breakthroughs aim to minimise carbon footprints and safeguard the earth's delicate ecosystems. Always with an eye on what's next, SK On delves into broader battery applications such as Energy Storage Solutions (ESS) and Battery-as-a-Service (BaaS).


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THE ELECTRIC VEH

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HICLE TRANSITION
Y INFORMATION

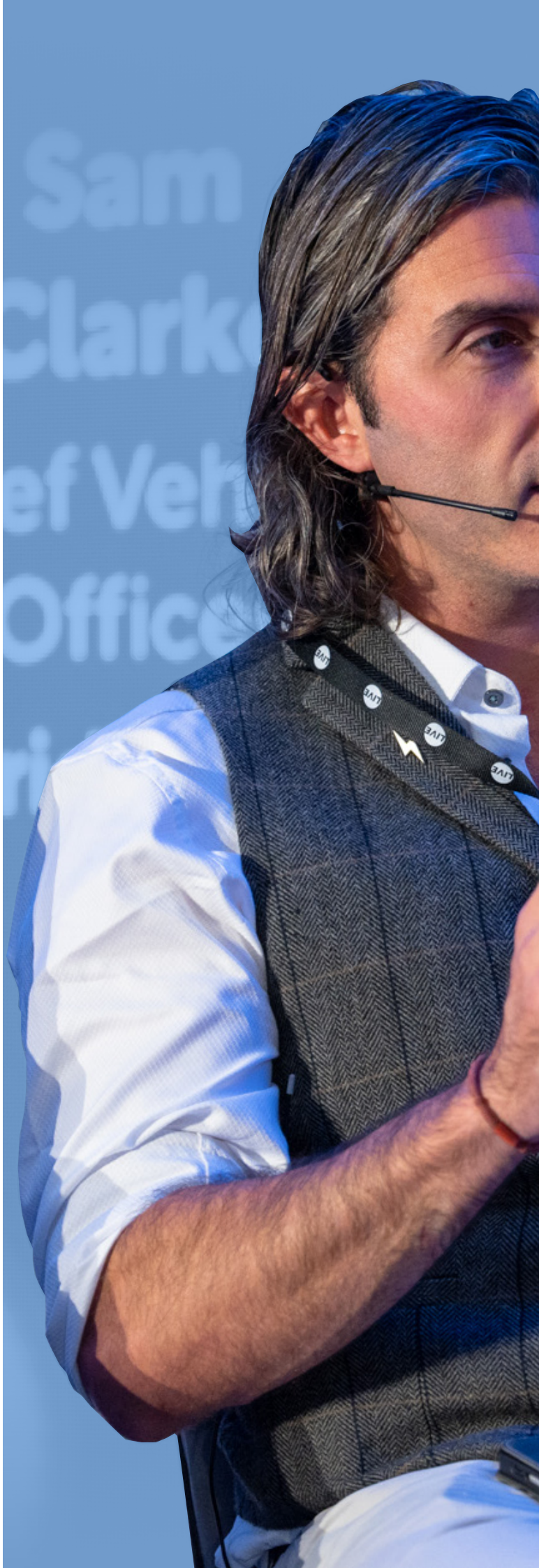
Highlights from ***Sustainability LIVE London*** and insights into the the cost of supplying and running EVs both privately and commercially in years to come

It's no surprise that when both consumers and businesses consider switching their internal combustion engine (ICE) vehicles for electric counterparts that the cost is a major factor driving their decisions. Peeling away from a century of fossil-fuel-burning vehicles is no mean feat, as can also be seen in areas like technology where digital transformation is still unfolding today.

The idea of change is what allows businesses to come to the fore and reduce their impacts on the planet, but do the benefits outweigh the risks? The Sustainability LIVE conference at the Business Design Centre, London, played host to some professionals in the industry with truly applied examples of how electrification can impact everyone, but also enable a number of commercial benefits if considered correctly.

One of the key themes of this topic was cost, but with two references – the monetary cost to the owner and the physical cost to the planet. With that said, the Sustainable Transport Forum covered EVs and mobility as a general trend, which is influenced by the sheer diversity of requirements of businesses and their fleets.

As explained early in the panel discussion by Martin Kochman, VP, Customers and Industries at Hitachi, EVs are "clearly part of the jigsaw and it also depends what targets we're talking about. In terms of where we will meet certain targets, EVs play a role. In metropolitan areas, I'm sure EVs will be a significant force. Perhaps outside of metropolitan areas, less so."



INFORMATION IS THE KEY TO A BETTER RELATIONSHIP WITH EVs

This is where information is vital to helping businesses understand the facts about EVs. In order to help more organisations adopt electrified cars for their fleets – or in some cases, other alternative transport solutions – they must first understand that there is no single measure of cost that can determine their sentiments towards owning them.

To put this simply Sam Clarke, Chief Vehicle Officer at GRIDSERVE, says that the idea of using electric cars, vans or trucks must be put into perspective before organisations can turn their heads away from them.

> "I DON'T STOP TO CHARGE NOW. I CHARGE BECAUSE I'VE STOPPED"

SAM CLARKE

TITLE: CHIEF VEHICLE OFFICER

COMPANY: GRIDSERVE

INDUSTRY: EVs AND ENERGY

LOCATION: UNITED KINGDOM

His entrepreneurial journey started back in 2002 with electric motorbikes and scooters before embarking on emission-free logistics (Gnewt) which he sold to John Menzies Plc in 2017. He now works on national charging infrastructure (GRIDSERVE) to support all types of EV charging.

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"Vehicle costs are coming down," says Clarke. "The total cost of ownership is very important. So, we can make people aware of the fact that capital costs of the vehicles might be higher, but the running cost is so much lower. You club those two things together and you'll find that electric vehicles are cheaper to run than the petrol or diesel equivalents."

This point is further explained as Kochman reiterates some of the differences between business locations, frequent routes, and overall operations with reference to low impact zones.

> **"THEY'RE CLEARLY PART OF THE JIGSAW AND IT ALSO DEPENDS WHAT TARGETS WE'RE TALKING ABOUT"**
>
> **MARTIN KOCHMAN**
>
> **TITLE:** VP, CUSTOMERS AND INDUSTRIES
>
> **COMPANY:** HITACHI
>
> **INDUSTRY:** TECHNOLOGY
>
> **LOCATION:** UNITED KINGDOM
>
> Martin Kochman is a VP in Hitachi Vantara's European Digital Services business. He specialises in running major data driven programmes and was responsible for 'Optimise Prime', the world's biggest commercial electric vehicle project.

"If you drive an EV in a congestion-charge zone, it's about 10% cheaper than a conventional vehicle versus driving one outside where it's actually 4% more expensive than driving a conventional vehicle."

What we can gain from these points reverts back to the key idea of perspective. What these executives are saying is that there are a number of things to be considered before making the switch. This can be as broad as the budget for each vehicle to more granular details like the selected charging tariffs and how private charging integrates with the site on which it is installed.

From the perspective of another panellist, Peter Gallagher, Commercial Director of Extreme E: "There needs to be more focus on cost in terms of manufacturing. We talk about cars and public transport, but also mining and the infrastructure of construction is quite key as well."

This point focuses more on information from different industries and what is physically achievable for them, which ties into the idea of perspective. Understanding the constraints and demands of organisations in the supply chain makes a huge impact on people's opinions of EVs as the scapegoats for 'EV bashing'. By recognising the supply chain issues and the need for further innovation to mine more lithium, generate more materials, and bring down the costs behind the scenes, consumers and businesses may become more understanding of the challenges in building low-cost EVs.

"From the supply side, there's a shortage of lithium, and there's a shortage of platinum. I think governments should work together a bit closer to make sure that manufacturing still sticks and enable people to actually buy them at a market rate."

"THERE NEEDS TO BE MORE FOCUS ON COST IN TERMS OF MANUFACTURING"

PETER GALLAGHER

TITLE: COMMERCIAL DIRECTOR

COMPANY: EXTREME E

INDUSTRY: MOTORSPORT

LOCATION: UNITED KINGDOM

Peter Gallagher is the Commercial Director for the fully electric off-road motorsport Extreme E. Gallagher specialises in topics like sustainability, equality and energy tech, which are all championed across electric motorsport.

OPTIMISE PRIME: AN EV ACCELERANT CAMPAIGN

Today, the Optimise Prime network innovation project released its concluding report, which summarises insights gleaned from four years of experimental activity.

Over the course of the project, data was collected from more than 8,000 electric vehicles (EVs) used for business operations across three separate trials. Various technical and commercial strategies were employed with the objective of hastening the shift towards EVs for commercial fleet managers. This initiative assists Great Britain's distribution network operators (DNOs) in strategizing and getting ready for the widespread uptake of EVs.

INFRASTRUCTURE IS EVERYTHING IN SUSTAINABLE TRANSFORMATION

With attention firmly on EV adoption now that the industry is rapidly evolving, a much larger spotlight is cast on the infrastructure required to power a full network of electrified vehicles on the roads in years to come.

As explained by the panel, much of the problem is a result of accessibility. While many drivers may notice a lack of charging stations in a specific area, the potential for blame on the energy sector and its output is somewhat inevitable. However, both Kochman and Clarke stress that sustainable energy capacity is available in the UK, but the ability to distribute it to new charging sites is the challenge that companies face.

This point arose as conversation about government input occurred with the panellists explaining how authorities and their legislation could be the key to enabling more sustainable opportunities in some areas of the industry. One example being localised sites to deliver independent energy.

“You put in the application to the local energy distribution company, and yo join the queue, then ‘see you in five years’ if you’re lucky,” says Kochman.

He continues to explain the thought of some independent retail sites with land available to build sustainable energy systems on, which again become hindered by legislative roadblocks.

“You run into endless regulations and constraints again even though you’re practically doing the whole thing yourself this time.”

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