LONDON

CreativeZer°

Green Screen
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THE FUEL PROJECT

SUPPLIER GUIDANCE REPORT
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Foreword from authors

While the global south has been feeling the impact for some time, this year, the climate crisis has provided Europe with its most direct evidence yet, with extreme heat, flooding, drought and wildfire. Immediate action to avert further greenhouse gas emissions from fossil fuels is necessary for the continuation of anything resembling life as usual, much less business. Furthermore, poor air quality, responsible for thousands of deaths each year in urban centres such as London, is also due largely to the combustion of these same fuels.

The film and television industry in London is acting to address its environmental impact and is an inspirational world leader in this space. We know that positive and innovative action on the climate crisis is good for business, helping to protect the jobs and lives that the world relies on to make high quality, thoughtful and entertaining content.

The industry's contribution to greenhouse gases and air pollution is dominated by fuel consumption. Half of a production's carbon footprint comes from fuel use across transport and mobile power services. This is where the greatest action can and has to be made.

For change to happen, it is key that all stakeholders are included and supported in this process. Suppliers and rental houses are a key part of the transition as they provide most of the vehicles which transport the technologies, materials and services that the industry relies upon. Similarly, it is suppliers who own and contract the generators which power much of film and TV production.

This report has been commissioned by the Interreg Europe funded Green Screen project. It aims to support those supply companies as they seek to play their part in moving towards a low emission industry by implementing informed business decisions which are good, not only for the profitability of that company, but for the protection of our collective future. The report also aims to provide examples and transferable learnings to other parts of Europe, supporting the transition to more sustainable practices in the film and television industry in Europe.

This research has been informed by suppliers, production companies, vehicle experts, low carbon energy specialists, environmental consultants, sustainable business strategists, energy equipment manufacturers, film commissions and film agencies. Synthesising these conversations together, this report offers film and TV production suppliers up-to-date insights on their opportunity for helping cut emissions from the industry.

Laurence Johnson Sustainability Manager Film London
Roxy Erickson Sustainable Business Consultant Creative Zero
Alexander Lewis-Jones Sustainable Mobility Consultant

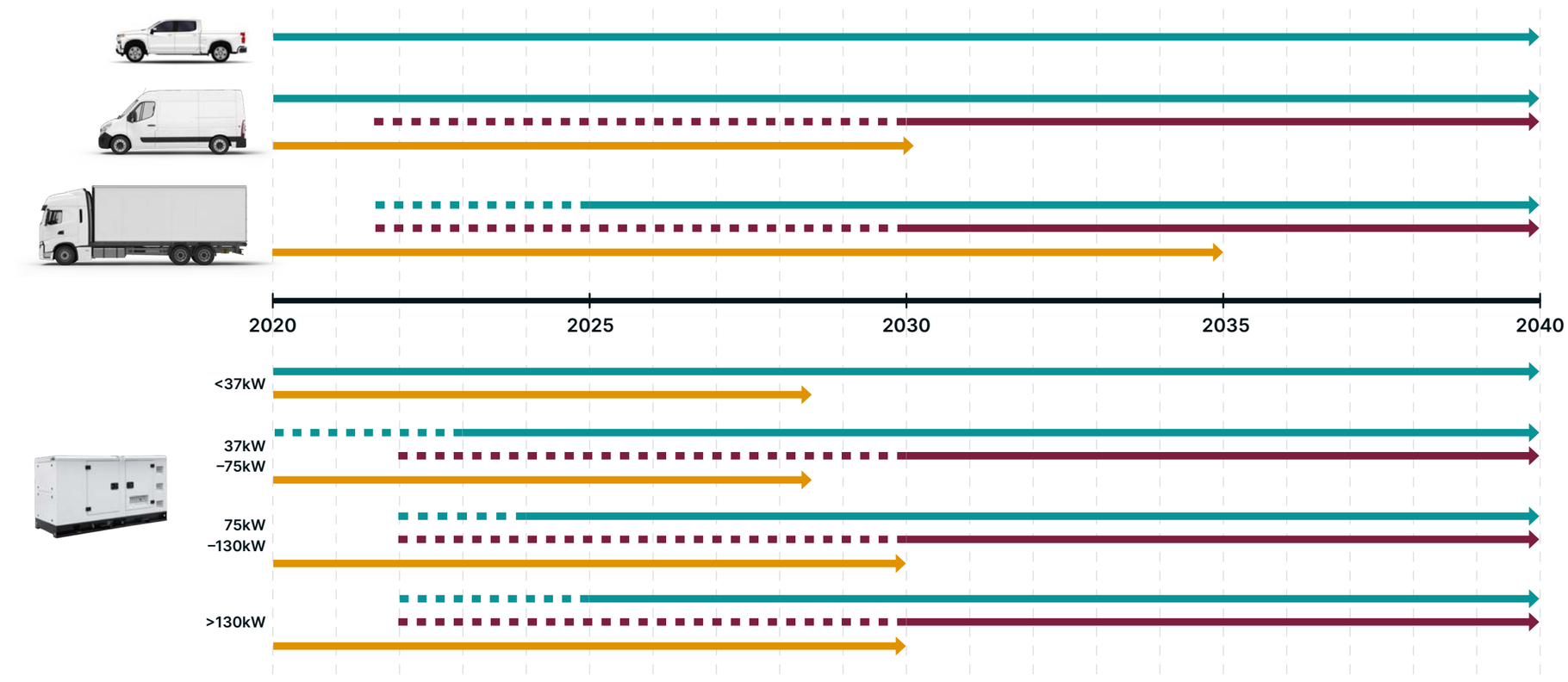
Image: Lê Minh - Photo of Men Holding Camera

01

EXECUTIVE SUMMARY

Timeline demonstrating development, availability and market readiness of the low carbon technologies covered in this report.

Figure 1: These dates are approximate and based on technology availability and preference. Synthesis of key dates gathered from literature available, and primary research conducted in summer 2022.



The direct consumption of fuel accounts for approximately 50% of the carbon footprint of a film production[1]. This impact is amplified by the contribution to poor air quality in urban areas, especially London.

Given the enhanced environmental challenges the capital faces, London is pioneering both policies and technologies to cut emissions. The Mayor of London is keen to build green industries within the capital[2], and this includes the arts. At the same time, the UK Government, EU legislation and major production companies and studios are making global commitments to tackle climate change.

As the film and TV production industry continues through a phase of substantial growth in the capital, now is the time to explore pathways to rapidly reduce emissions from the sector's vehicles and generators. The industry must ensure that investment supports the transition to a low carbon economy and that it is not spent on status quo equipment that will become stranded assets in the near future.

By ensuring the cleanest assets are operated with the greenest energy sources in the most efficient way, film and TV production suppliers play a pivotal role in reducing emissions in the industry.

As production companies seek to cut their respective environmental impacts, consulting around the needs of each production can identify quick wins and potential for technological experimentation. However, sustained change can only come from the internal and

By ensuring the cleanest assets are operated with the greenest energy sources in the most efficient way, film and TV production suppliers play a pivotal role in reducing emissions in the industry.

holistic transformation of the companies involved in those productions. While emissions targets may vary between productions, the trajectory of industry decision-making overall is directed towards low emissions and industry companies should ensure they are aligned.

As shown in figure 1, the adoption of three key technologies is critical for the transition. Electrifying assets via batteries is already possible today. Hydrogen is also considered a long-term solution, with testing and commercial availability increasing over the coming years. Hydrotreated Vegetable Oil (HVO), when sourced responsibly, is a bridge solution for legacy assets where alternative technology is not yet viable.

> Adopters of key technologies can benefit from lower operational costs in the long run.

These innovative technologies are, in many cases, already providing production benefits beyond the air pollutant and greenhouse gas (GHG) emissions reduction (silent operation on set, for example). At the same time, these technologies face challenges related to supply chains, higher capital costs, infrastructure suitability and lack of power capabilities versus physical size or load capabilities.

Forward-thinking supply companies are adopting sustainable procurement practices that encompass both the total cost of ownership and total emissions of ownership (TCO and TEO). Adopters of key technologies can benefit from lower operational costs in the long run. A combination of government incentives, innovative trials and new business models can support the transition to these technologies. End clients, investors and production companies are looking harder at their respective Scope 3 emissions - an emissions source largely linked to their upstream supply chain. Those suppliers who offer lower emission solutions should be looked at favourably, as triple bottom line (People, Planet, Profit) and ESG metrics become commonly adopted by production companies and the wider economy.

This report summarises the opportunities for cutting emissions significantly from the sector and considerations for each of the three key technologies, including why they should be a part of every supplier's investment strategy.

Image: Skoon

CONTENTS

INTRODUCTION

Image: Film London - Female director in production

Film production is booming in London, with international feature productions generating over £1.3 billion in 2019[3].

TV drama is now at the highest level ever seen in the capital and accounts for 30% of all filming. Nationally, this growth in international investment and the rise of high-end television (HETV) has led to an increase in spend from £3.4 billion in 2017, to over £5.64 billion in 2021[4]. London is now the third largest production centre in the world and supports 49,000 jobs in the capital[5].

Whilst this growth is welcome, it is vital that absolute emissions decrease. Due to the mobile nature of film production, fossil fuels have traditionally powered many aspects of a shoot, from cast and crew travel, to equipment transport and power generation. This adds to already high levels of GHG (Greenhouse gas) emissions and air pollutants in the capital.

From a global climate perspective, the latest IPCC reports give the world just eight years to reduce GHG emissions by 43%[6]. Roughly 50% of a production's carbon footprint comes from burning fuels (35% for road transport and 15% for diesel generators[7]).

These same emitters are responsible for air pollution, delivering a significant impact on human health. A third of all deaths from stroke, lung cancer and heart disease are caused by poor air quality[8]. The release of air pollutants is especially severe in London, where two million people live in areas exceeding legal limits[9].

The latest IPCC reports give the world just eight years to reduce GHG emissions by 43%. Roughly 50% of a production's carbon footprint comes from burning fuels (35% for road transport and 15% for diesel generators).

With industry, city and global expectations on businesses changing, transforming assets to low emission versions is a strong choice that can increase market resilience and lower measured emissions and responsibilities for offsetting now and in the future.

Collaboration is key to ensure that investments in sustainability do not impact competition. Given the current global fuel issues and future legislation, not to mention further stranded assets and climate concerns, higher upfront costs of new technologies may balance with reduced operational costs and an increase in customer appetite for low emission suppliers over an investment cycle. Therefore, it is worth considering that any new investment in fossil technologies will tie in carbon and emissions for years to come and may make the product obsolete in the near future.

Given the range of vehicle and generator use in London's film and television industry, the solutions are varied. This report provides a synthesis for suppliers to:

- understand the three key technologies that will play a role in cutting emissions.
- explore actions for tackling emissions from vehicle fleets
- explore actions for tackling emissions from power generators

GLOSSARY OF TERMS

Air pollution	Local environmental impacts caused by the emission of harmful gases and airborne particles. Vehicles and generators are regulated to these emissions, rather than greenhouse gases.
B20	Biofuel with 20% of blend of biological origin, 80% from fossil origin.
B30	Biofuel with 30% of blend of biological origin, 70% from fossil origin.
BEV	Battery Electric Vehicle
Biogenic waste	Vegetable waste product that can be used for the production of renewable fuels.
Embedded emissions	The greenhouse gas emissions involved in the manufacturing of the product, emitted before the use of that product.
Euro (V, VI)	The European standard for air quality emissions from vehicles. Light vehicles are set by standards Euro 1 to 6, while heavy vehicles are set by standards Euro I to VI. Each Euro stage represents a more stringent minimum requirement for newly manufactured products.
FCEV	(Hydrogen) Fuel Cell Electric Vehicle
GHG	Greenhouse Gases
Green hydrogen	Hydrogen sourced from renewable energy.
HBRF	High Blend Renewable Fuels
HETV	High-end Television
HGV	Heavy Goods Vehicle
HVO	Hydrotreated Vegetable Oil
IPCC	Intergovernmental Panel on Climate Change
LEZ	Low Emission Zone. There are two LEZs referenced in this report. One applies to vehicles and the other to NRMM (referenced below). It is important to note the areas covered by these zones differ.
LCA	Life Cycle Analysis. In this report this refers to the greenhouse gas emissions of the entire life cycle of the vehicle, from manufacturing, to use and maintenance, to the disposal of the vehicle.
NOx	Nitrogen oxides. Potent air pollutant common in powertrain exhausts.
NRMM	Non-Road Mobile Machinery refers to any transportable powered equipment, including power generators.
PM	Particulate Matter. The small fractions of dirt and dust that occur from combustion and friction processes. These are categorised by size: PM10 and PM2.5 are 10 and 2.5 micrometres in diameter, respectively.
Scope 3	One of three scopes of greenhouse gas emissions, categorised by the GHG Protocol, refers to all of a business's emissions, excluding emissions directly emitted by the business activity (Scope 1) or emissions emitted indirectly by electricity produced for business activity (Scope 2).
Stages (e.g. IIIa, V)	The European standard for air quality emissions from engines in Non-Road Mobile Machinery. Like with vehicle standards, stages typically represent a more stringent minimum requirement for newly manufactured products. Different stages apply depending on whether the engine is constant or variable.
TCO	Total Cost of Ownership. An approach for considering both capital and operating costs over the cycle of ownership, to aid long-term financial decision-making.
TEO	Total Emissions of Ownership. An approach to assessing emissions made across the cycle of ownership, to aid sustainable procurement decision-making.
ULEZ	Ultra Low Emission Zone

02

THE FUEL OF FILM PRODUCTION

Analysis of supplier data has demonstrated the diversity of generators and vehicles used across the industry.

Vehicle fleets typically include a mix of large vans and HGVs. Data captured from London boroughs by the Generator Project[i] shows that less than two thirds of the capital's generators on set are small and medium (less than 75kW).

ENVIRONMENTAL IMPACT

Emissions from generators and the tailpipes of road vehicles sits at the centre of the combined challenges of global climate change and local air pollution.

The emission of carbon dioxide from the tailpipe makes road transport the UK's leading source of greenhouse gases. Compared to all other sectors, road transport makes up the greatest share of the UK's carbon footprint, has shown the slowest progress in reducing emissions since 1990[10] and has experienced the fastest rebound in emissions since 2020[11].

Delayed by the coronavirus pandemic, the Stage V standard for generators only arrived in 2020. Only approximately 12.5% of diesel generators operating on film and television productions in the capital achieve this compliance level[12].

Emissions of air pollutants, such as nitrogen oxides (NOx) and particulate matter (PM), make fuel consumption the leading cause of poor air quality. This is the largest environmental risk to public health in the UK, known to be a leading cause of cardiovascular and respiratory diseases. Imperial College London estimates 3,600 to 4,100 lives are lost prematurely each year in London alone, due to long-term exposure to these emissions[13].

According to The Generator Project data, only

12.5%

of diesel generators operating on film and television productions in the capital are Stage V compliant.

i Sign up to the Generator Project to participate and receive quarterly newsletters updating on the performance of generators in London: https://thegeneratorproject.org/#About

Analysis of vehicle fleet categories used within the film production industry
Figure 2

CAR

SUV/Pickup	2.1t

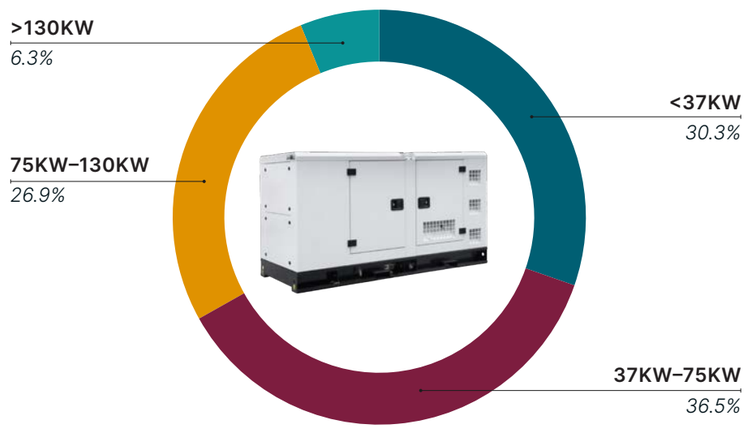
VAN

Medium Wheelbase	2.1t
Long Wheelbase	3.5t

HGV

Rigid 2 axle	7.5t
Rigid 2 axle	18t
Tractor unit 3 axle	26t
Tractor unit 4×3	36t

Size of generators by percentage on London shoot locations as reported to The Generator Project
Figure 3



LEGISLATION AND THE PATH TO ZERO

London is one of the most celebrated case studies globally for zone charging policies[14]. What happens in London impacts decisions made by cities across the UK and inspires others around the world.

Since 2017, the fleet of road vehicles has both reduced in number and got cleaner, attributable to the introduction, expansion and enhanced regulation of three zones[15]. The table below summarises the requirements for exemption to charges for entry into each zone across categories of vehicle in 2022[i].

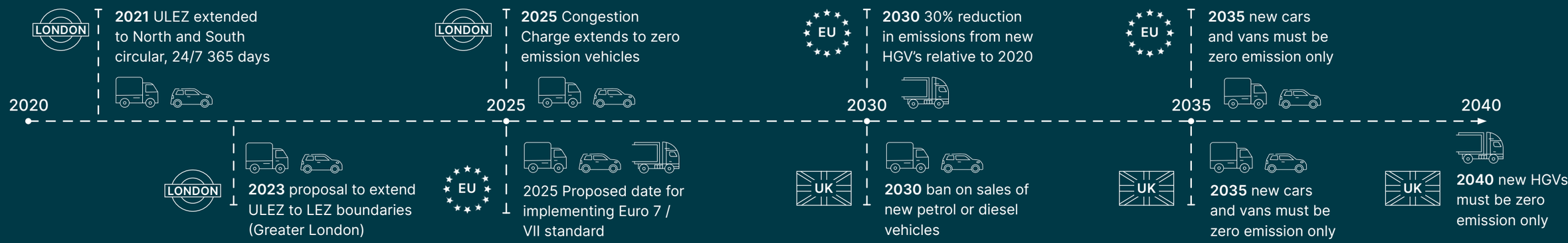
London's Non-Road Mobile Machinery (NRMM) Low Emission Zone (LEZ) sets minimum standards for generators on construction projects[16]. Film production sites do not have industry specific emission regulations but given that legislation will only tighten around air quality in the future, following LEZ for NRMM requirements as a minimal practice is recommended.

Note that the LEZ for vehicles and the LEZ for NRMM are two separate policies, with different requirements, penalties and geographies. Both should be checked.

Existing charging zone requirements for road vehicles in London.
Figure 5

	CONGESTION CHARGE ZONE	ULTRA LOW EMISSION ZONE (ULEZ)	LOW EMISSION ZONE (LEZ FOR VEHICLES)
MOTORBIKES	No requirement	Euro 3 NOx (Petrol)	No requirement
CARS	BEV (battery electric vehicle) or FCEV (fuel cell electric vehicle)	Euro 4 (Petrol) Euro 6 (Diesel)	No requirement
VANS (<3.5T) & MINIBUSES (<5T)	BEV or FCEV Minibuses	Euro 4 (Petrol) Euro 6 (Diesel)	Euro 3 PM (Diesel)
HGVS & COACHES	Coaches	Matches LEZ for vehicles requirements	Euro VI NOx and PM (Diesel)

Timeline of planned and proposed legislation to cut emissions from road transport across London, the UK and Europe.
Figure 4



> The UK Government has the ambition of ending the sale of new petrol or diesel vans by 2030.

Policy is evolving at different scales of governance. The timeline below summarises how car, van[ii] and HGV fleets are being legislated and should inform how the industry purchases and operates these fleets as society transitions permanently away from fossil fuels across London, the UK and Europe.

While targets may evolve, the UK Government has set the ambition for over half of all van sales to be zero emission by 2030. In June 2022, the UK Government consulted industry on the Zero Emission Vehicle (ZEV) mandate – a required percentage of all newly registered cars and vans must be BEV or FCEV from 2024[17]. At the time of writing, the consultation results have yet to be published.

Existing LEZ for NRMM requirements in London.
Figure 6

	CENTRAL ACTIVITIES ZONE AND OPPORTUNITY AREAS[iii]	REST OF LONDON
<37KW	No requirement	No requirement
37-75KW	Stage IV	Stage IIIB
75-130KW	Stage IV	Stage IIIB
>130KW	Stage IV	Stage IIIB

i Further information on the Congestion Charge Zone, ULEZ and LEZ for vehicles, including a map, is available on the Transport for London website: https://tfl.gov.uk/modes/driving/ultra-low-emission-zone/ulez-where-and-when?intcmp=52227#on-this-page-1

ii Within UK Government regulation, a van is considered up to 3.5t (4.25t if zero emission). Vans weighing more than 3.5t are treated as HGVs.

iii Opportunity Areas includes 47 areas across London, including Canary Wharf. For further information and a map of these zones: https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/opportunity-areas/londons-opportunity-area

03

CURRENT AND FUTURE FUEL TECHNOLOGIES

While a large percentage of vehicles and generators can transition to lower-emission options now, there are also technologies in development that will reduce emissions further.

The following section highlights the most important technologies for the transition of fuels.

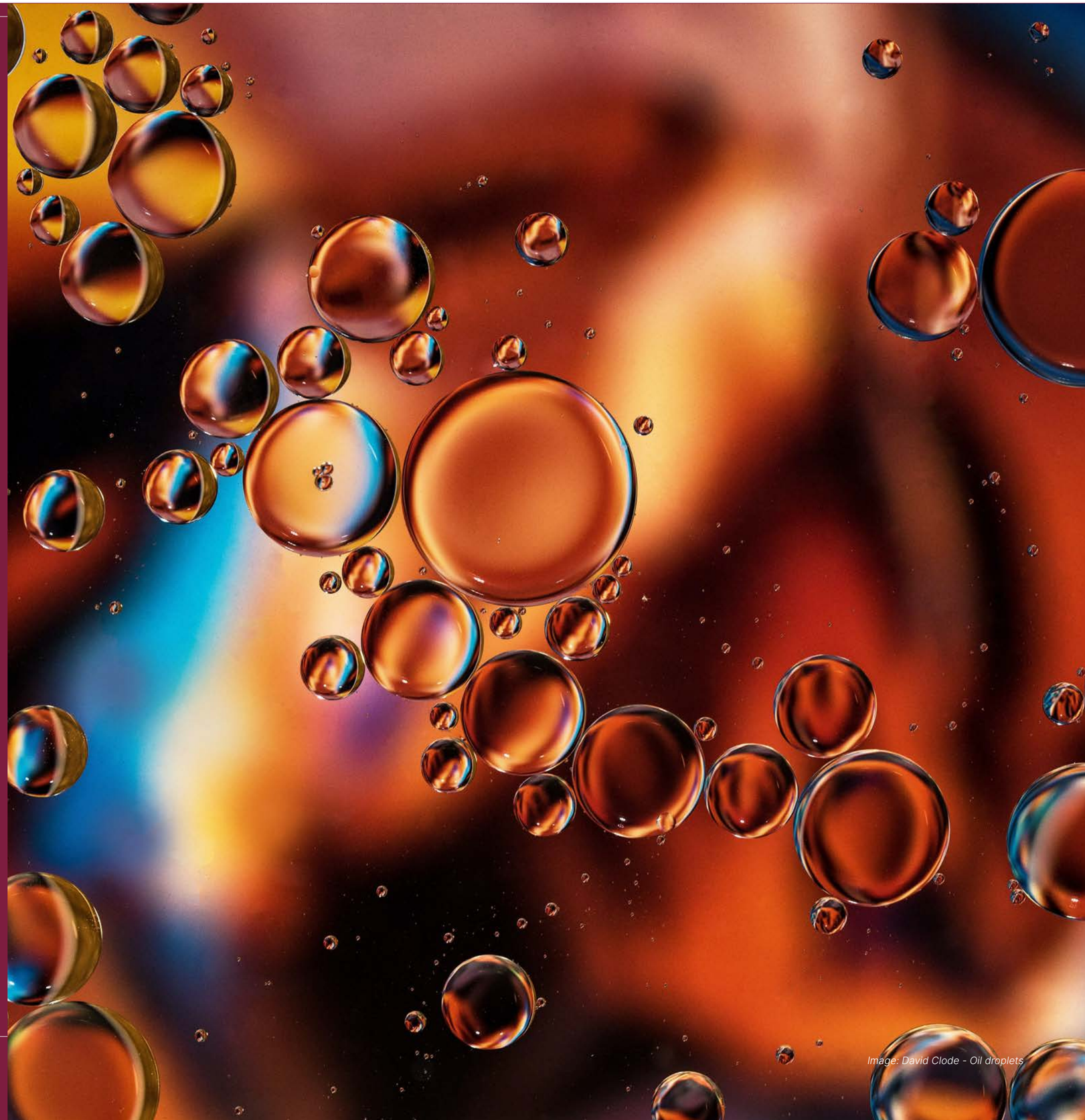


Image: David Clode - Oil droplets

BATTERIES

With a growing market maturity, batteries are an increasingly in-demand solution for cutting emissions from generators and transport.

WHAT IS IT?

An electric drivetrain is powered by an on-board battery, charged up from the electricity grid. Battery research is developing rapidly but most used for transport and power are based on Lithium-ion technology.

WHAT ARE THE BENEFITS TO URBAN AIR QUALITY?

Without an exhaust system, the battery electric drivetrain emits no air pollutants into the local atmosphere, making a 100% improvement on fuel-based equivalents. For moving vehicles, non-exhaust emissions (tyre wear, brake wear, road interaction) will remain.

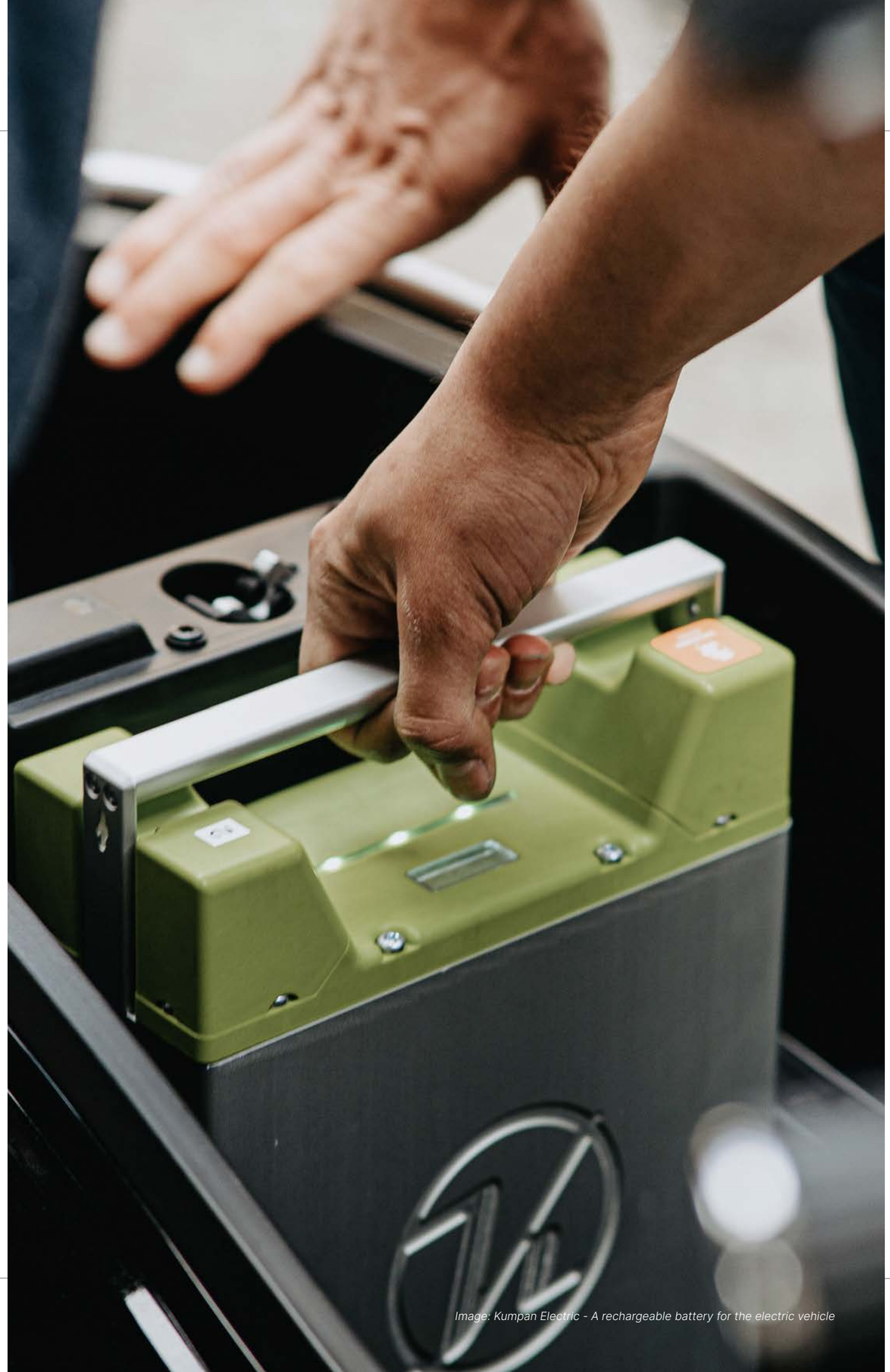


Image: Kumpan Electric - A rechargeable battery for the electric vehicle

WHAT ARE THE BENEFITS TO GREENHOUSE GAS REDUCTION?

A Life Cycle Analysis (LCA) considers the entire GHG impact of a vehicle and its fuel use through its lifespan. When the LCA is considered for battery electric products, they are shown to result in a 65% reduction in greenhouse gases compared to the retail diesel equivalent[i 18]. This reduction will increase over time as the UK's electricity grid continues to decarbonise. To maximise impact, the electricity that charges the battery should be from on-site renewables, such as solar panels on facility roofs or purchased from a 100% renewable electricity provider. Adopting these measures would enable a greenhouse gas reduction closer to 90%.

WHAT ARE THE ENVIRONMENTAL CONCERNS ASSOCIATED?

Concerns exist around the mining of lithium, cobalt and precious minerals for battery production. This significantly increases the environmental impact of product manufacturing. These concerns are leading to innovations in the battery manufacturing industry including the development of less metal-intensive technologies, such as sodium-ion batteries, as well as battery preservation and recycling technologies. Due to both the retained value and legal obligations around batteries, manufacturers are taking back assets at the end of the product's life cycle to create new products. There is a very low risk of landfill waste.

i This data is based on a study of HGVs operating on the UK electricity grid in 2020.

HYDROGEN

Hydrogen is the least market ready of the current fuel options. However, some models of power generation are already being used on London sets. Hydrogen is forecast to become a major part of the 2030s energy system though will only be a part of some supplier's next equipment investment cycle.

WHAT IS IT?

Hydrogen is a gas with higher energy density than current battery technologies. Hydrogen can be used in a combustion engine or to power an electric motor via a fuel cell. Hydrogen fuel cell solutions have received more development in recent years.

WHAT ARE THE BENEFITS TO URBAN AIR QUALITY?

Combusting hydrogen emits pollutants impacting on air quality. This impact can be mitigated when emissions control technologies are used[i].

Hydrogen fuel cells power electric drivetrains, therefore emitting no air pollutants into the atmosphere. The only emission from the exhaust is pure water that does not impact climate change at this level[ii]. For moving vehicles, non-exhaust emissions will remain.

i Selective Catalytic Reduction (SCR) technology avoids emissions of nitrogen oxides from exhaust systems.

ii Water vapour itself is a potent greenhouse gas but not when emitted at a surface level.

Image: Volvo - The Volvo FH Fuel Cell Electric semi at a hydrogen fuel station.

WHAT ARE THE BENEFITS TO GREENHOUSE GAS REDUCTION?

When the LCA is considered, the operation of hydrogen systems will lead to an 80% reduction in greenhouse gases compared to the retail diesel equivalent[19]. This reduction relies on the adoption of 100% green hydrogen.

Sources of hydrogen are categorised into colours[20], green representing those sourced by electrolysis using excess renewable power. Currently, the UK market is dominated by grey hydrogen sourced from natural gas, a process that emits carbon dioxide into the atmosphere[iii] and is not recommended.

WHAT ARE THE ENVIRONMENTAL CONCERNS ASSOCIATED?

The absence of green hydrogen supply and infrastructure limits the opportunity for emissions savings today. The existing hydrogen market in the UK is not supplied with what is seen as a low carbon supply and a 'rainbow' of sources will continue to make up the future of this market.

Working directly with those producing green hydrogen via small scale projects around the British Isles is the best approach for guaranteeing a low emission fuel at this stage of the market.

A fuel cell system also requires a battery, so similar environmental concerns must be considered as with battery electric technology.

iii Longcross Studios are currently working with PlusZero to explore the opportunity to generate green hydrogen on site, ensuring their own reliable low carbon supply.

HVO

Yet to be widely adopted in the UK, Hydrotreated Vegetable Oil has emerged as a promising option within the renewable fuels market.

WHAT IS IT?

HVO is considered a renewable diesel rather than a biodiesel. While commonly adopted biodiesels, B20 and B30, are a blend with fossil diesel, HVO is derived from 100% vegetable oil and should be sourced from waste stock.

WHAT ARE THE BENEFITS TO URBAN AIR QUALITY?

Figures from industry testing report modest NOx and PM reductions of 5-10% and 10-33% respectively[21] in comparison with diesel use (independent testing unavailable). Non-exhaust emissions (tyre wear, brake wear, road interaction) factor into the overall pollution impact too.

WHAT ARE THE BENEFITS TO GREENHOUSE GAS REDUCTION?

Industry figures show HVO can reduce greenhouse gas emissions by 90% compared to the retail diesel equivalent[22]. When the fuel is included in the LCA of a diesel engine vehicle, HVO contributes to an 80% reduction in greenhouse gases[23]. However, this can only occur when the fuel is guaranteed to be sourced from local biogenic waste - waste organic materials.

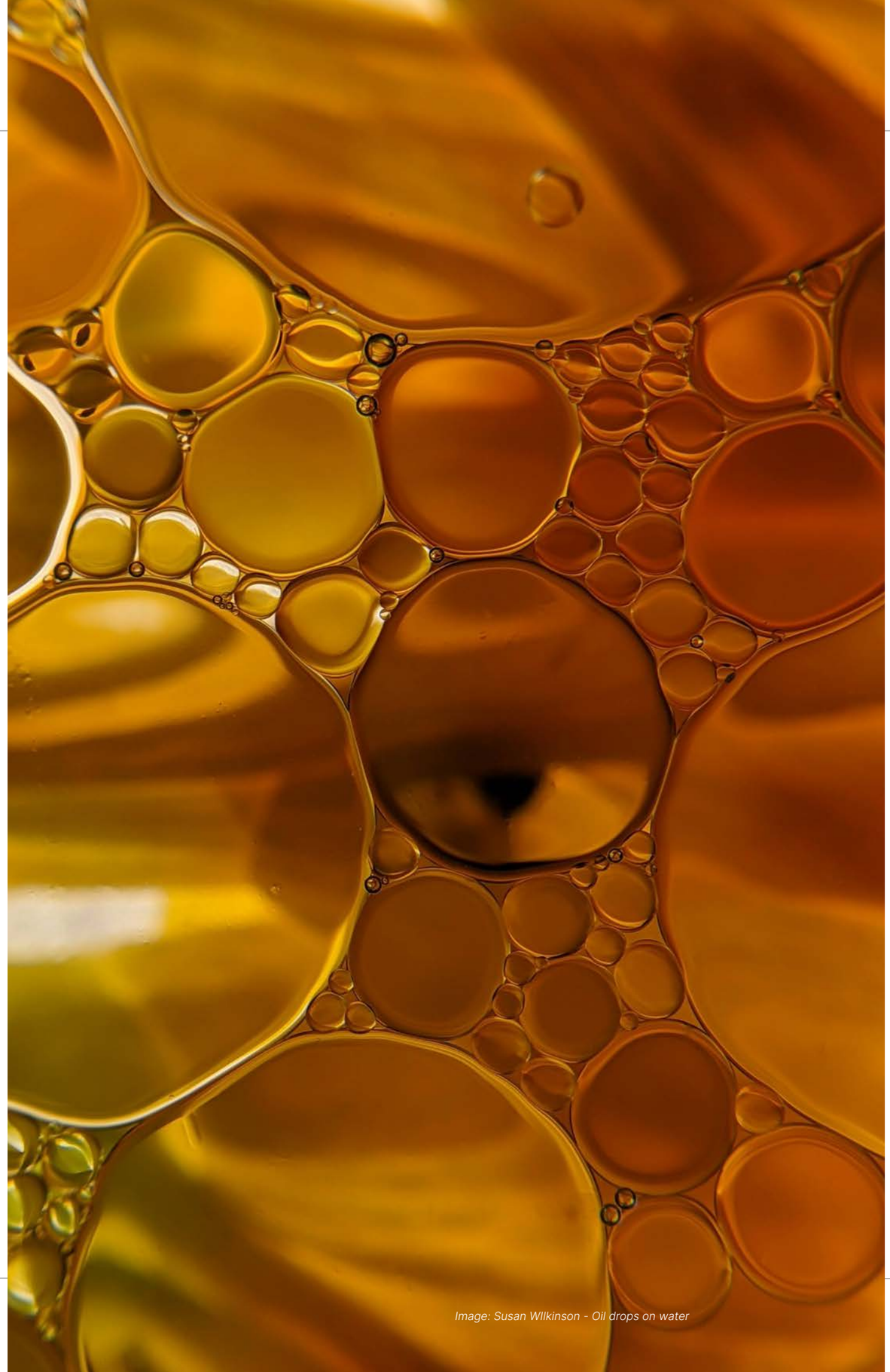


Image: Susan Wilkinson - Oil drops on water

An additional lifespan benefit of HVO is that it is a drop-in for an existing vehicle. This allows for additional GHG savings as the emissions associated with manufacturing or retrofitting a new vehicle and drivetrain (which come with BEV and FCEV) can be avoided.

WHAT ARE THE ENVIRONMENTAL CONCERNS ASSOCIATED?

HVO is a better option than diesel but should only be viewed as a transition fuel for legacy vehicles where battery and hydrogen options are not viable. The use of HVO should not be used to validate investment in new combustion engines where alternative technology is available.

Uncertainty over the real world benefits of HVO stems from multiple factors associated with the supply chain. The use of virgin palm oil is criticised due to its well established impact on biodiversity loss and deforestation globally. Used cooking oils may be sourced at a global scale, the transportation of which reduces the greenhouse gas reduction benefits. Furthermore, demand is reported to be adding pressure to other feedstock supplies, which, again, may be fuelling additional deforestation[24]. Providers of HVO from unsustainable sources have previously received fines for greenwashing[25].

If HVO is used for legacy diesel assets, it should have ISCC accreditation and be sourced from excess waste produced as locally as possible - within Europe, if not the UK. HVO providers should be able to assist with purchasing HVO from regions where greater transparency exists and should push for greater regulation for longer supply chains that lack such transparency.

04

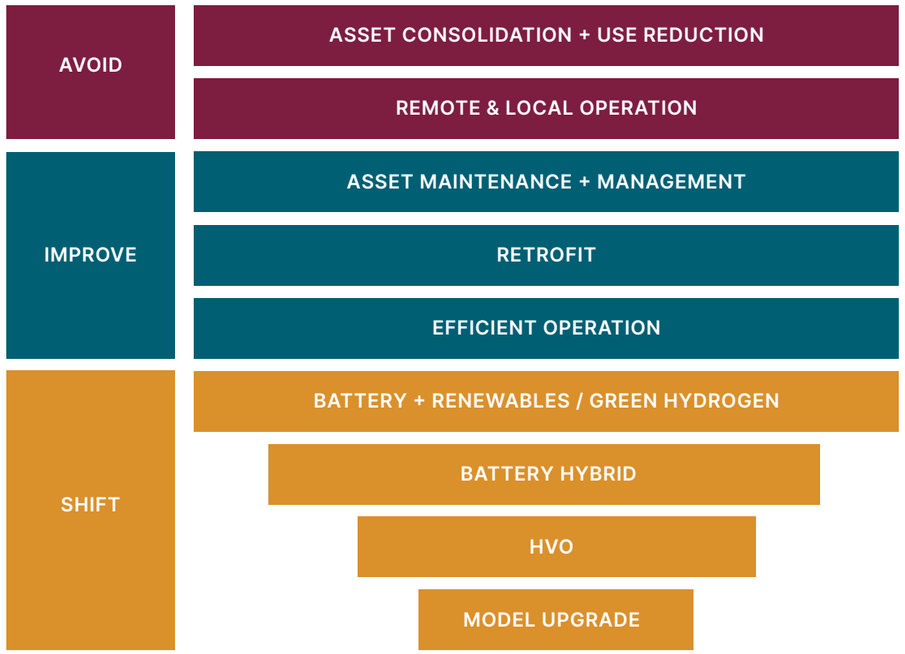
TACKLING FUEL EMISSIONS FROM VEHICLE FLEETS

Using the steps of Avoid-Improve-Shift can help build a strategy for suppliers to the film and TV production industry in London.

Image: Chuttersnap

An Avoid-Improve-Shift model for film and TV supplier emission reductions in London.

Figure 7: Actions within the model are not mutually exclusive – these can be stacked upon each other to ensure the industry has the cleanest vehicles, using the greenest energy and operated in the most efficient way.



Avoid

The most effective way to cut emissions is to not have that activity in the first place.

While transport is a necessity, consolidating the number of vehicles will avoid further embedded carbon while consolidating orders and deliveries will avoid unnecessary mileage, immediately cut emissions and save costs. Long-term efficiency measures may allow for a permanent reduction in fleet numbers while maintaining the same level of service to clients. Local operation refers to managing satellite hubs for local distribution of assets, thereby avoiding additional transport-related emissions.

Such measures are often not achievable overnight and require strategic fleet and business review. Consulting closely with the production company/client about their needs can establish 'quick wins' for avoidance. Likewise, consider 'carrot and stick' options for urgent, unplanned or last-minute client delivery avoidance. Production teams might need further support to understand the distance that suppliers are travelling to set, leading to local suppliers being prioritised to lower transport emissions further.

Advocating for industry action on transport emissions and education for those involved in making transport decisions will also be necessary to create emission avoidance across the sector.

Improve

These include common, well-adopted fleet management practices to ensure efficiency throughout the use of existing assets and decrease costs for businesses.

Before actions are taken, adopting a sustainable procurement policy helps a business develop key metrics on the Total Cost of Ownership (TCO) and Total Emissions of Ownership (TEO), allowing businesses to understand the baseline of their costs and impacts.

Without creating substantial new strategies or capital investments, there are several ways a supplier can cut carbon and costs. The Energy Saving Trust publishes guidance on this, summarising guidance on six quick wins for truck fleets[26] but applicable to all:

- Encouraging fuel-efficient driving behaviour
- Measuring fuel consumption
- Fitting the best tyres, keeping them inflated
- Route optimisation
- Improving the aerodynamics of the vehicle
- Introducing telematics to help manage the fleet

In all circumstances, ensuring full adoption of telematics and ensuring drivers are well trained can avoid considerable maintenance, fuel emissions and costs.[i]

i The Royal Mail fleet offers a good case study for this: https://www.commercialfleet.org/news/latest-news/2021/02/18/royal-mail-rolls-out-telemetry-system-to-improve-fleet-efficiency

SUPPLIER TIPS:

- Consider implementing rules around driver commutes, requiring drivers to leave large vehicles at depots and commuting in via public transport where appropriate, to see a further cut in fuel costs and emissions.

Image: Pixipixel

Upgrade via retrofit

Low Emission Zone requirements dictate Euro VI for HGVs and all fleet managers should aim to achieve this level as a minimum[i].

Retrofit is an option typically for heavier and specialist, high value fleets. The ULEZ and LEZ for vehicles minimum required standards of Euro VI may not be possible for custom or vintage vehicles. While these may receive exemptions based on age, retrofit upgrades to cleaner engines may be an effective solution.

Conversion technology providers can enable a fleet to transition to almost any alternative drivetrain. This is particularly valuable for dual fuel hybrids where auxiliary power is required. BEVs are typically bought new because they require different architecture, but battery and motor conversions are increasingly available for combustion engine vehicles.

i The Euro VII is expected later in the decade.

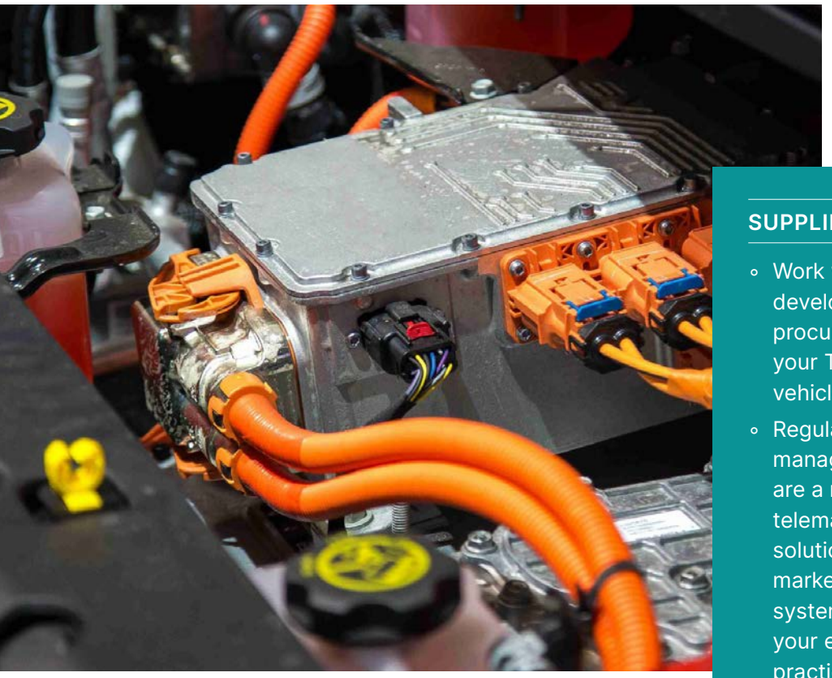
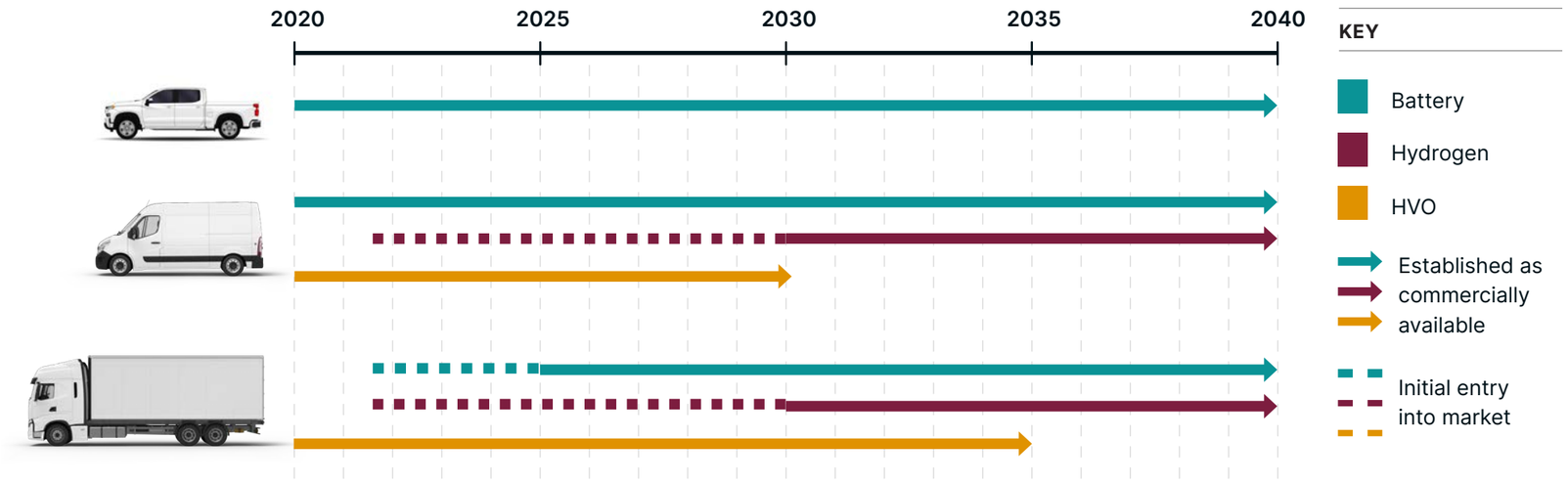


Image: patruflo - Electric drive unit

SUPPLIER TIPS:

- Work with specialists to develop a sustainable procurement policy to inform your TCO and TEO of each vehicle in your fleet.
- Regularly trial emerging fleet management software. There are a range of advanced telematics and measurement solutions coming to the market. Test out which systems work best with your existing management practices and systems.

Timeline demonstrating development, availability and market readiness of the low carbon transport.
Figure 8: These dates are approximate and based on technology availability and preference. Synthesis of key dates gathered from literature available, and primary research conducted in summer 2022.



Shift

Shifting to alternative technologies requires investment alongside advanced planning due to varying commercial availability.

Fleets should be expected to operate with multiple fuels and with vehicles from multiple manufacturers and of multiple sizes. By minimising the size of some vehicles in a fleet, operators will reduce emissions and can save considerable cost, both operationally and in capital.

Adoption of new technologies will be defined by duty cycles as well as technology availability – for instance, Euro VI vehicles may remain within a fleet for long-distance journeys for quite some time. However, this means that the remainder of the fleet should decarbonise far quicker.

SUPPLIER TIPS:

- Undertake an external audit of your fleet. You may be surprised to find your daily mileage, weight and speed needs are considerably lower than you think[i].
- The most effective actions are to shift to battery electric and hydrogen vehicles, both sourcing their energy from renewable sources. If these are not possible, your fleet manager should ensure the cleanest diesel engines are in operation, using sustainable HVO.
- Talk with your competitors, clients and suppliers to collaborate on demand for new technologies. Working with campaigns, such as EV100[27]. The more demand that is demonstrated to manufacturers, the faster the supply can be established for you.

i The Energy Saving Trust offers free reviews for various commercial fleets. Further details on which fleets qualify on their website: https://energysavingtrust.org.uk/service/fleet-support/

Shift: The three low carbon technologies for vehicle fleets

BATTERIES

Following success in cars, BEVs (battery electric vehicles) are increasingly available in commercial vehicle categories. A narrow market is now becoming a competitive one thanks to ambitious start-ups and Chinese entrants vying to capture commercial vehicle market share[i].

BEVs offer less noise, vibration and a smoother driving experience[ii]. However, vehicles have been limited by range (driving distance) and performance (e.g., taking heavy loads uphill). Early adoption has been most successful in van fleets with predictable duty cycles, shorter distances and "return-to-depot" operations. This allows "Business-As-Usual" operations without having to account for range limitations of the battery.

> Lower charging costs compared to diesel vehicles means the total cost of electric vehicle ownership can be comparable or less.

The recharging infrastructure solution should be ready ahead of vehicle acquisition. The optimal charging opportunity is when the vehicle is off shift. Installing charging infrastructure where the vehicle is stored allows the operator to benefit from the cheapest electricity tariffs and having full control over the charging cycles. If funding is available for solar panel installation, the fleet operating costs become exceptionally low. The solar investment could deliver a payback period within the first fleet cycle and will further benefit subsequent fleet cycles. This repayment timeline has decreased significantly due to current high energy prices.

Not every BEV can operate using depot-charging. For vehicles that are stored at employees' homes, solutions exist to offer recharging via the home and the business pays the electricity bill[iii].

Public charging networks for cars and vans are well established in London. Networks dedicated to large van and HGV fleets are in development too. Many EV charging providers offer access and payment for these networks[iv].

At this early stage in the market, capital costs are considerable for BEV vans and HGVs, although lower charging costs compared to diesel vehicles means the total cost of ownership can be comparable or less. The UK Government offers financial support via the plug-in van and truck grant[28] and innovation project funding.[v]

HYDROGEN

Outside of the bus and taxi sectors, few Fuel Cell Electric Vehicles (FCEVs) are commercially available today. Many manufacturers are launching products in the coming years with commercial availability across van and HGV categories by the middle of the decade.

The driving experience is like that of existing fleets. Hydrogen's high energy density allows vehicles to run for distances similar to diesel equivalents. The limitation for long-distance duty cycles is the absence of a public refuelling network across the UK.

Hydrogen infrastructure will develop with the commercial development of FCEVs. In 2022, there are twenty public-access refuelling stations in the UK, of which a quarter are within Greater London[vi].The Government plans to have networks across the UK developed for HGV use by 2027[29].

Depot owners may consider installation of their own refuelling infrastructure, but this will be a long-term investment requiring planning and engagement with local authorities. Upfront capital investment can be recovered from retailing to third-party fleets. Equally, a fleet can seek to partner with nearby depots looking to make that investment, such as local authorities or public transport operators that have hydrogen adoption strategies in place today.

Capital costs of FCEVs and associated hydrogen storage is higher than equivalent diesel fleets. Participation in demonstration projects can support initial investment on the basis that the fleet is willing to trial innovative technologies[vii].

HVO

HVO is celebrated by fuel suppliers for its benefits over both first-generation biodiesel and traditional diesel. It does not degrade; it performs well in cold weather and is odourless. The fuel is considered safer than traditional diesel by being non-toxic, biodegradable and has a decreased fire risk[30].

As a drop-in fuel, vehicle fleets operate with no modifications to vehicle or infrastructure. It is fully compatible with existing Euro VI and many older vehicles. Manufacturers will typically cover HVO usage under warranty[viii] though a conversation is advised, particularly for custom vehicles

> Manufacturers will typically cover HVO usage under warranty though a conversation is advised.

Per litre, it is more expensive than fossil diesel and without new fiscal support this premium is expected to remain for years to come[31]. There is potential to recover some of the costs from the reduced needs for maintenance.

Fuel delivery services operate directly to production locations in London, however, HVO is not currently available at forecourts around London (though some suppliers intend to enter this market[ix]). There is currently no production of HVO in the UK although reports suggest facilities may be planned for construction after 2025.

Production suppliers may find that they are able to house HVO tanks on site, due to decreased fire risk and smaller tanks being available. Suppliers could also consider recouping the capital investment costs of a tank by retailing HVO.

Both could lower fuel costs by creating an economy of scale. HVO suppliers deliver fuel to bunkered storage at client depots – typically justified for fleets of 20 or more vehicles. Installation requires planning as tanks vary from 200l to 100,000l capacities[32] and suppliers are designing solutions to meet limited space[x]. Unlike biodiesel, HVO is highly stable and can be stored for up to 10 years.

i The emergence of British-located start-ups Volta and Arrival has been met with enthusiasm while the influx of Chinese brands (e.g. Maxus, BYD) is creating a boom in affordable choice this decade.

ii Avoiding gear shifts and engine noise, electric drivetrains offer a more comfortable experience.

iii Mina offers a digital payment solution allowing businesses to pay directly for electricity used for business use at employees' homes. For further information: https://www.mina.co.uk/homecharge

iv Paua offers electric fuel cards for fleets. For further information: https://www.pauatech.com/

v Innovate UK regularly launch funding rounds for the latest zero emission transport technologies, with opportunities to participate as a demonstrator fleet. Details on funding rounds are maintained on their website: https://www.ukri.org/opportunity/

vi For an updated map of hydrogen refuelling projects, visit https://www.h2stations.org/stations-map

vii Innovative fleets, such as UPS, credit access to innovation projects as a key means to investing in low emission fleets. For a case study: https://energysavingtrust.org.uk/case-study/uk-power-networks-and-ups/

viii HVO adheres to both the EN15940 standard for paraffinic fuels and the ASTM D975 standard for diesel fuels. These are the standards typically required for manufacturer warranty.

ix HVO will be available at over 300 locations nationwide over the following 3 years.

x Green Biofuels UK "Smart tanks" product offers a storage solution designed to fit exactly one parking space.

Shift: Further Technologies

BATTERY ELECTRIC HYBRIDS

Various technology combinations exist and a hydrogen and battery hybrid may emerge as a successful solution later in the decade. For now, as long as diesel is still in operation, emissions savings and air pollution reductions will be more modest but hybrids offer a bridge to more powerful electric vehicles. Geofencing enables electric driving to be prioritised for urban mileage, reducing a fleet's contribution to air pollution in populated areas. Many types exist today, and expect more to emerge over the coming decade for van and HGV fleets:

- **Conventional hybrid** – Energy is recaptured from vehicle braking, delivering this back as electric power when the vehicle moves on. This technology improves fuel economy.
- **Plug-in hybri**d – A parallel hybrid where a small electric drivetrain is charged up via a plug socket and operated separately to a fuel drivetrain in the same vehicle.
- **Range-extended hybrid** – A series hybrid where an electric drivetrain can be charged up from an auxiliary combustion engine, onboard the vehicle, when the battery is low.

Image: Ziga Plahutar - Electric car

SUPPLIER TIPS:

- Explore the market. Your preferred vehicle supplier for diesel may not be the preferred choice for BEV or FCEV.
- Use fleet management tools to assess "quick wins" within your fleet. Those vehicles doing local, low mileage "return-to-dept" duty cycles.
- Explore opportunities to join a demonstrator project to grant-fund vehicle trials in your fleet, particularly for hydrogen combustion and FCEV.
- Explore partnerships with other fleets or depots using hydrogen near your base.
- Secure direct access to green hydrogen supplies.
- Consider co-investing in a HVO tank with others who have a high adoption of heavy fleet and generator ownership. Modern tanks can operate with a similar system to traditional fuel cards. This may allow you to buy at a higher economy of scale, increase access, advocate for change in your community and lower capital expenditure.
- Seek fuels with ISCC (International Sustainability and Carbon Certification[33]) standards for sustainable HVO.
- Consider fuel suppliers on the Zemo Partnership's Renewable Fuels Assurance Scheme[34], a verification scheme to guarantee renewable quality.

BIOMETHANE

An emerging solution for gas vehicles is biomethane sourced from biogenic waste. As a drop-in methane replacement, it can dramatically cut GHG emissions to legacy fleets[35]. Using manure as a source has the additional benefit of avoiding uncontrolled emissions that leak into the atmosphere, enhancing the GHG emission reduction further.

Despite significant benefits, biomethane has not been considered in detail in this report because unlike diesel, there is a low penetration of natural gas vehicles in the UK and the future direction of major manufacturers, such as DAF, is to exclusively produce electric drivetrains. Transition of diesel fleets to electric drivetrains is recommended over gas alternatives.

WALKING AND CYCLING

For moving people, switching to public transport, walking or cycling are further Shift options which businesses can encourage within their workforces.

For urban deliveries, the electric-assisted cargo bike is becoming a popular solution in London[i]. With a payload capacity range of 80-400kg, it is argued cargo bikes offer city deliveries that are faster, cheaper and cleaner than a van[ii]. Cargo bikes can climb hills even when loaded and can deliver a range of up to 50km. These should be considered as a supplement for last minute, urgent and agile deliveries of small batches of equipment.

i Grip Van, an equipment rental company in London, operates a cargo bike for their services. For further information: https://gripvan.com/blog/2020/8/5/on-your-bike

ii Pedal Me, a cargo bike operator in London, offer extensive analysis on this argument. For further information: https://pedalme.co.uk/why-cargo-bikes/

GREY FLEET

Grey fleet refers to personal vehicles, typically cars or vans, being used for business purposes. Grey fleet mileage may be quite substantial for ad-hoc journeys but there is little control or visibility over these vehicles. Solutions for cars are typically modal shift to public transport. Return-to-depot operations offer the business more control over the mileage of each vehicle than allowing fleet vehicles to be taken home by employees.

The UK Government currently offers strong tax incentives for employees to access BEVs via their employer[i]. Consider these as both a value-add within the benefits package for employees, and a way of reducing grey fleet and employee commuting emissions. This brings down the overall cost of grey fleet from expensed fuel and cost of offsetting.

i Pod Point offer a useful guide to calculating company car tax: https://pod-point.com/guides/business/company-electric-car-tax Octopus EV offers details on the EV salary sacrifice scheme: https://octopusev.com/salary-sacrifice

05

TACKLING EMISSIONS FROM POWER GENERATORS

The Avoid-Improve-Shift model can also be applied to decision-making for generator investment.

Image: Federic Beccari

An Avoid-Improve-Shift model for film and TV supplier emission reductions in London.
Figure 9: Actions within the model are not mutually exclusive – these can be stacked upon each other to ensure the industry has the cleanest vehicles, using the greenest energy and operated in the most efficient way.

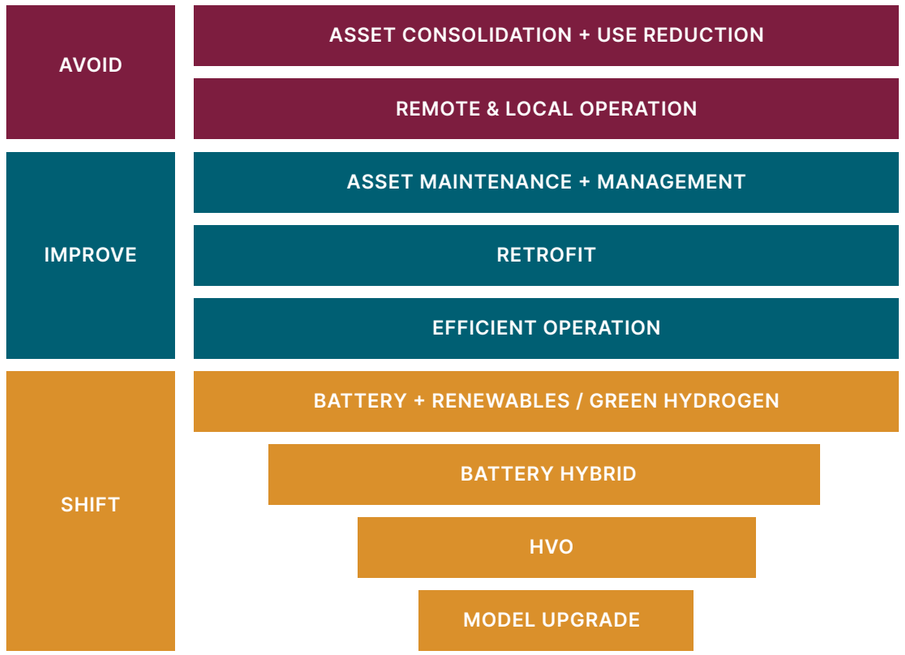



Image: Film London - Filming Suffragette external credit UK Parliament Stefan Hill

Avoid

The optimal means of cutting emissions from power generation is by consolidating the number of generators, offering to clients the right-sized generator for the job and reducing usage.

The most effective means of use reduction is by prioritising a mains power connection over a generator. Establishing power capacity availability is a challenge which is why Film London is collaborating with stakeholder groups to identify opportunities. Projects such as the Grid Project[36] are underway to install permanent power access at popular unit base locations across London. This project aims to reduce the need for generators on location in film and TV production.

At the same time, demand-side actions achieve consolidation and reduction. Over-specification of generator orders is common when productions seek to avoid the chance of running out of power. However, energy-efficient devices, such as LED lighting, with lower power demands are now commonplace on set. Production-supplier consultation must support a production to access the right solution for their needs, avoiding oversized generators, overconsumption of fuel and additional emissions.

As 66.8% of generators on sets across London are currently small or medium[37], it is likely low carbon solutions, like batteries or smaller than traditional Stage V generators, may be fit for purpose more often than assumed.

Ensuring the correct size of generator is provided is a responsibility suppliers share with production. Conversations about energy consumption are vital and should take place during prep. This will help to ensure your client base is well informed and will use your equipment efficiently. Likewise, it may be necessary to create hybrid sets where batteries or hydrogen are the main power sources but diesel generators are kept as back up. Though not ideal, this "emergency back up" could be a use for out-of-date diesel generators while the industry gets comfortable with modern power generation reliability.

Remote monitoring and diagnostics, via software platforms ensures up-time and allocation of generators. This can identify opportunities where generators are running but not needed.

SUPPLIER TIPS:

- In order to make clear the true cost of diesel generators against their cleaner alternatives, consider adding approximated diesel costs on estimates, rather than waiting for the final invoice (even when fuel costs may not come from you in the end).

Improve

Increasing efficiency on the supply and demand sides of power generation helps decrease carbon emissions. Keeping generators maintained allows for improved fuel efficiency.

Like a vehicle fleet review, reviewing the generator assets is important to understand the TCO and TEO of the existing business. Sustainable procurement policy principles will drive both these metrics downwards, with future asset renewal decisions.

Upgrade via retrofit

While it may not be required for the sector yet, generators should be upgraded from Stage IIIA or earlier to Stage V. This will improve emissions while likely allowing for continued return on investment. At a minimum, clients should be advised by suppliers not to use Stage III or earlier generators, in line with the LEZ for NRMM. The Energy Saving Trust Retrofit Accreditation Scheme certifies NRMM products to support London's LEZ for NRMM.[38]

Shift

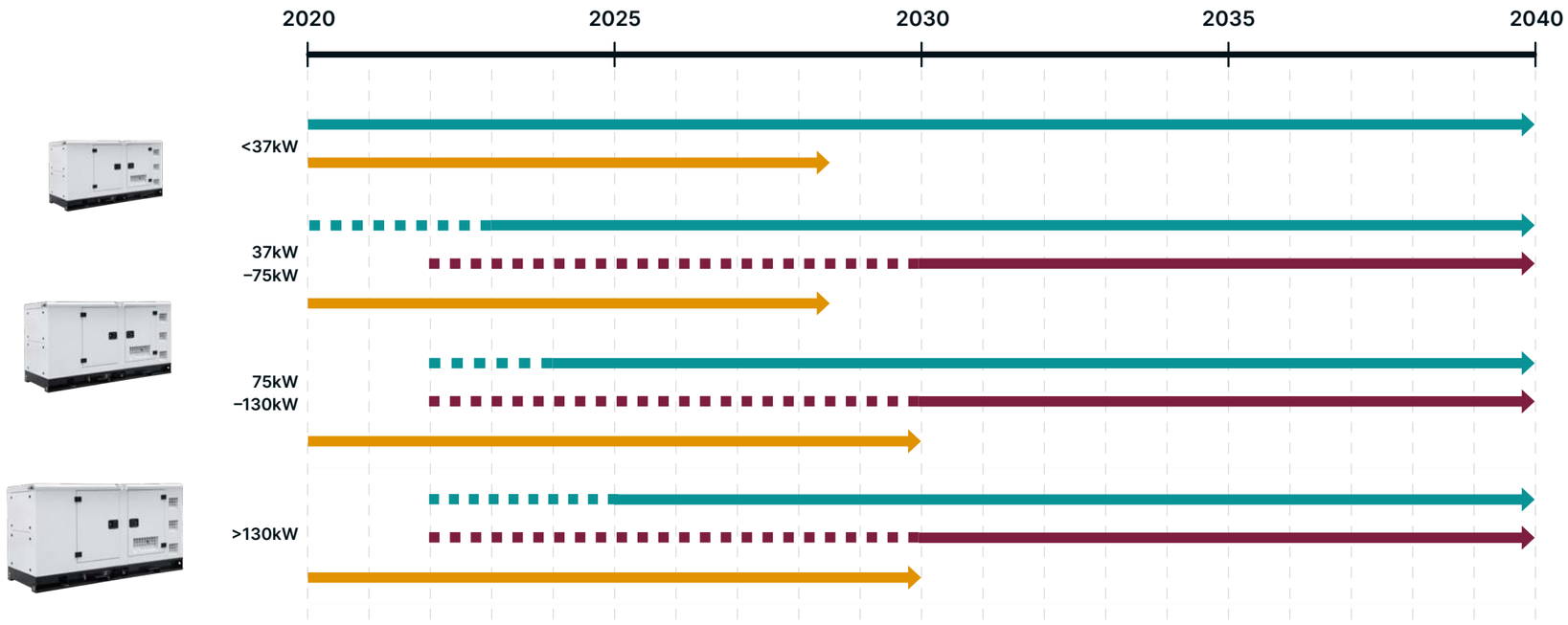
Whilst many alternative power generation options are available now...

others still require research and development before long-term commercial viability and secure supply chains are established. Despite this, there are an increasing number of manufacturers entering the UK market.

Renewable-backed battery and hydrogen storage units are the most effective sources for low emission power generation. Where supply chains and availability are an issue, Stage V generators powered by HVO fuel offer a short term solution.

Timeline demonstrating development, availability and market readiness of the low carbon generators covered in this report

Figure 10: These dates are approximate and based on technology availability and preference. Synthesis of key dates gathered from literature available, and primary research conducted in summer 2022.



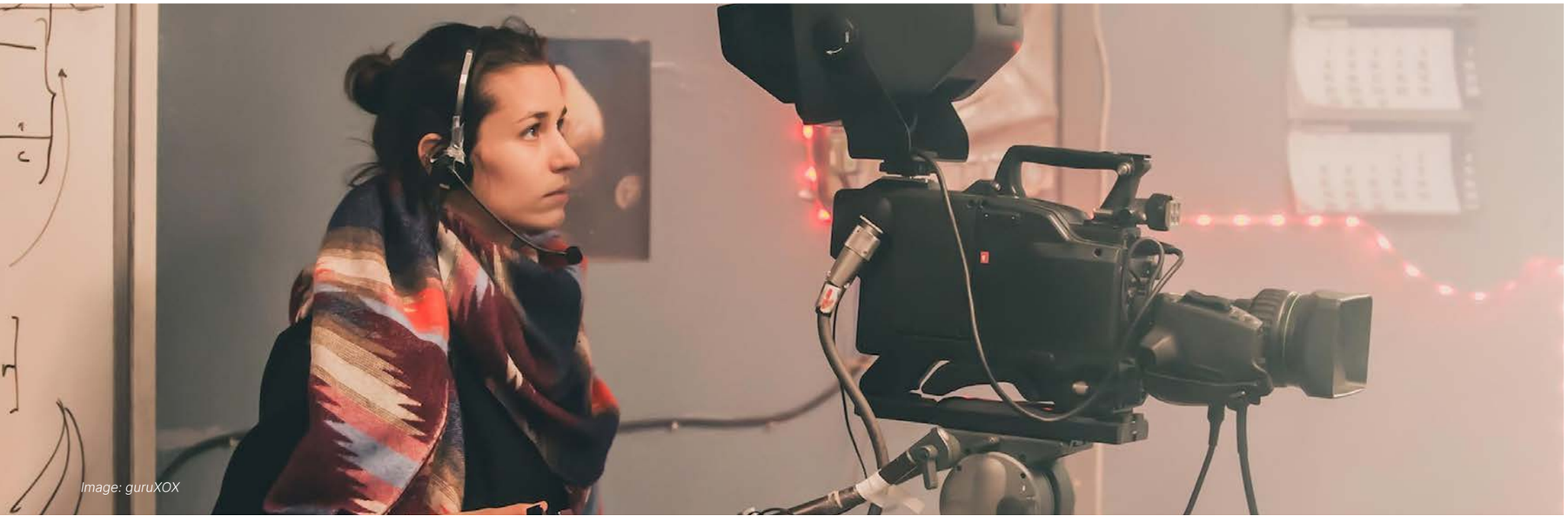


Image: guruXOX

Shift: The three low carbon technologies used for power generators

BATTERIES

Battery storage units are increasingly available for mobile power supply. With improvements in energy density, units are becoming smaller.

Whilst the last few years have seen batteries with lower power capacity requirements, this is changing as new tech is entering the market[i]. Some manufacturers are even working towards 1 MW batteries.[ii]

Battery storage units offer a flexible solution, operating in both static and portable applications for constant or variable power requirements.

The largest batteries tend to be static units, with portable batteries typically having more limited energy and power capacities.

Battery storage units require recharging facilities, the location of which will be connected to the national grid or ideally to on-site renewable sources. If charging from the grid, choose an electricity supplier that can offer a renewable tariff and inform on the greenest times to recharge.

When in storage in a depot, battery generators can help cut further emissions by managing the recharging of equipment to be as green and cheap as possible.[iii]

There are several benefits to offering clients battery power. Compared to fuel-based generation, batteries offer silent power with zero emissions, a key benefit when operating on set. Additionally, the lack of fumes, vibration and noise mean batteries can be positioned much closer to set, reducing the amount of cabling needed.

> Compared to fuel-based generation, batteries offer silent power with zero emissions, a key benefit when operating on set.

Whilst the upfront cost of renting a battery system can be double of a diesel generator, once diesel costs are taken into consideration the cost becomes comparable. A supplier must communicate this to the production client.

With generators, capital costs are much higher than the diesel equivalent and costs are not expected to drop due to increasing demand and supply chain limitations. Manufacturers are increasingly offering direct-to-customer rental services to overcome the upfront cost barrier – this could lead to a long-term shift in the market, which will be partially dependent on how traditional generator suppliers choose to invest and interact with these new technologies.

Semiconductor and metal shortages are affecting global manufacturing supply chains. Research with battery solution providers showed power generation is also affected. While it may be many years for the shortages to recover, demand will increase as more industries move to battery technology. The portable power generation sector, whilst not holding as large a market share as transport or permanent power infrastructure, may struggle to compete for assets.

HYDROGEN

Two hydrogen solutions are being deployed for power generation: direct combustion and fuel cell electric units. Both operate as static hydrogen power units for medium and large power capacities.

Hydrogen fuel cell power units have traditionally been larger than batteries (about the size of a shipping container). This is compensated for by having greater power and greater storage capacity than the battery equivalent but creates challenges around transportation. Sizes are starting to decrease with smaller mobile units being released in 2023[iv]. Fuel cells have the advantage of allowing for silent power and are zero rated for particulate matter emissions.

The alternative to the fuel cell is the hydrogen generator which uses direct combustion of hydrogen for power. Manufacturers claim that removing the fuel cell allows for a faster roll out due to using market-ready technology that is reliable and lower cost. In addition, hydrogen generator units have been smaller than fuel cells, allowing for similar transportation to the diesel equivalent. As mentioned above, this is starting to change.

Operators can expect similar performance to the diesel generator. Hydrogen combustion and fuel cell power can be made variable or constant as per the needs of the production.

In addition to the challenges around supply of green hydrogen, the greatest challenges to further expansion of hydrogen power systems are currently availability of units and cost. However, with many manufacturers pursuing plans for rapid expansion, both the supply and cost challenges should work to improve in tandem over time.

> Under the UK Government scheme EX55, a production can reclaim 100% of fuel duty when using HVO to generate electricity.

Whilst lack of infrastructure and high upfront costs are a challenge, manufacturers are combining the rental of hydrogen power units with a dedicated supply of guaranteed green hydrogen.

Hydrogen storage and supply infrastructure can be a challenge for temporary site locations, such as unit bases. This includes the transportation of hydrogen on site and therefore requires planning.

HVO

As with diesel vehicles, HVO acts as a drop-in fuel for existing diesel generators.

HVO is celebrated by fuel suppliers for its benefits over both first-generation biodiesel and traditional diesel. It does not degrade; it performs well in cold weather and is odourless. The fuel is considered safer than traditional diesel by being non-toxic, biodegradable and has a decreased fire risk.[39]

Under the UK Government scheme EX55, a production can reclaim 100% of fuel duty when using HVO to generate electricity[40]. This could make HVO a similar price or cheaper to retail diesel but this depends on the fuel supplier agreement[v].

Fuel delivery services operate directly to production locations in London. There is currently no production of HVO in the UK although reports suggest facilities may be planned for construction after 2025.

Production suppliers may find that they are able to house HVO tanks on site, due to decreased fire risk and smaller tanks being available.

Suppliers could also consider recouping the capital investment costs of a tank by retailing HVO. Both could lower fuel costs by creating an economy of scale. HVO suppliers deliver fuel to bunkered storage at client depots. Installation requires planning as tanks vary from 200 to 100,000 litre capacities[41] and suppliers are designing solutions to meet limited space[vi]. Unlike biodiesel, HVO is highly stable and can be stored for up to 10 years.

i Green Voltage now supply trailer mounted 60kwh to 90kwh E-Gens alongside their 2k and 5k Voltstack units.

ii Sunbelt Rentals and Aggreko are currently developing 1 MGW plus batteries.

iii In some scenarios, it may be possible to operate a battery to perform microgrid services: charging up the battery during a cheaper tariff or greener period for the grid and discharging that flexibly into equipment.

iv Geopura are set to release a 60kW towable 'HPU Agile' in 2023

v Speak to an HVO supplier in advance about support when reclaiming.

vi Green Biofuels UK "Smart tanks" product offers a storage solution designed to fit exactly one parking space.

Image: Film London - Poirot cleared Richmond BFS

SUPPLIER TIPS:

- Reports from experts in the field suggest that studios, streamers and broadcasters may begin to enter into longer term contracts with low carbon energy equipment suppliers to support those suppliers' investment in high-capital equipment. Talk to your industry partners and customers about whether this is something they can support you with. In addition, manufacturers report a desire to collaborate with independent rental companies for ownership of new systems, while offering continuing maintenance support.
- Get to know the emerging sector of battery and hydrogen manufacturers, many businesses are new and entering the production sector. Building early partnerships may be financially beneficial.
- Explore partnerships with other fleets or depots using hydrogen near your base.
- Secure direct access to green hydrogen supplies.
- Where shifting to battery or hydrogen is not currently possible, consider co-investing in a HVO tank with others who have heavy fleet and generator ownership. Modern tanks can operate with a similar system to traditional fuel cards. This may allow you to buy at a higher economy of scale, increase access, advocate for change in your community and lower capital expenditure.
- Seek fuels with ISCC (International Sustainability and Carbon Certification[42]) standards for sustainable HVO.
- Consider fuel suppliers on the Zemo Partnership's Renewable Fuels Assurance Scheme[43], a verification scheme to guarantee renewable quality.

Shift: Further technologies

BATTERY ELECTRIC HYBRIDS

In addition to having a mix of power generators at one unit base, battery and hydrogen solutions are increasingly available as hybrid systems

The most common is a diesel generator with battery parallel hybrid (separate units connected). This combination increases the range when mains power is not available. This combination is ideal for batteries because it manages energy consumption, maximising battery discharge during the peak of use and slowly recharging the battery from the diesel engine at optimal load during quieter periods. Fuel savings of 30 to 80% are reported for generators running a hybrid system with a battery unit, in comparison to running a traditional generator[i]. Not only does this reduce emissions and pollution from the system, but the reduced fuel costs can offset the cost of hiring the battery, making it appealing to production teams. Additional generators can be supplied for emergency backup[ii].

Fuel savings of 30 to 80% are reported for generators running a hybrid system with a battery unit, in comparison to running a traditional generator.

Supplementing power generation with mobile solar panel arrays reduces the demands on fuel consumption further.

DIGITAL SOLUTIONS

To improve access to low carbon power, tech solutions may play a role in the future. For example, Skoon are beginning to operate as a marketplace, connecting low-carbon power-generation solutions, to customers and industries who need them[iii]. From a supplier perspective, this helps ensure systems are hired out and utilised to their greatest potential, ensuring a faster return on investment.

i Fuel reduction savings noted have been supplied by temporary power technology suppliers such as Aggreko, Sunbelt and Zenobe.

ii A HVO-powered generator can be offered as a backup for clients using battery systems for the first time.

iii Skoon Energy are working in Europe and developing close connections with the film and TV industry.

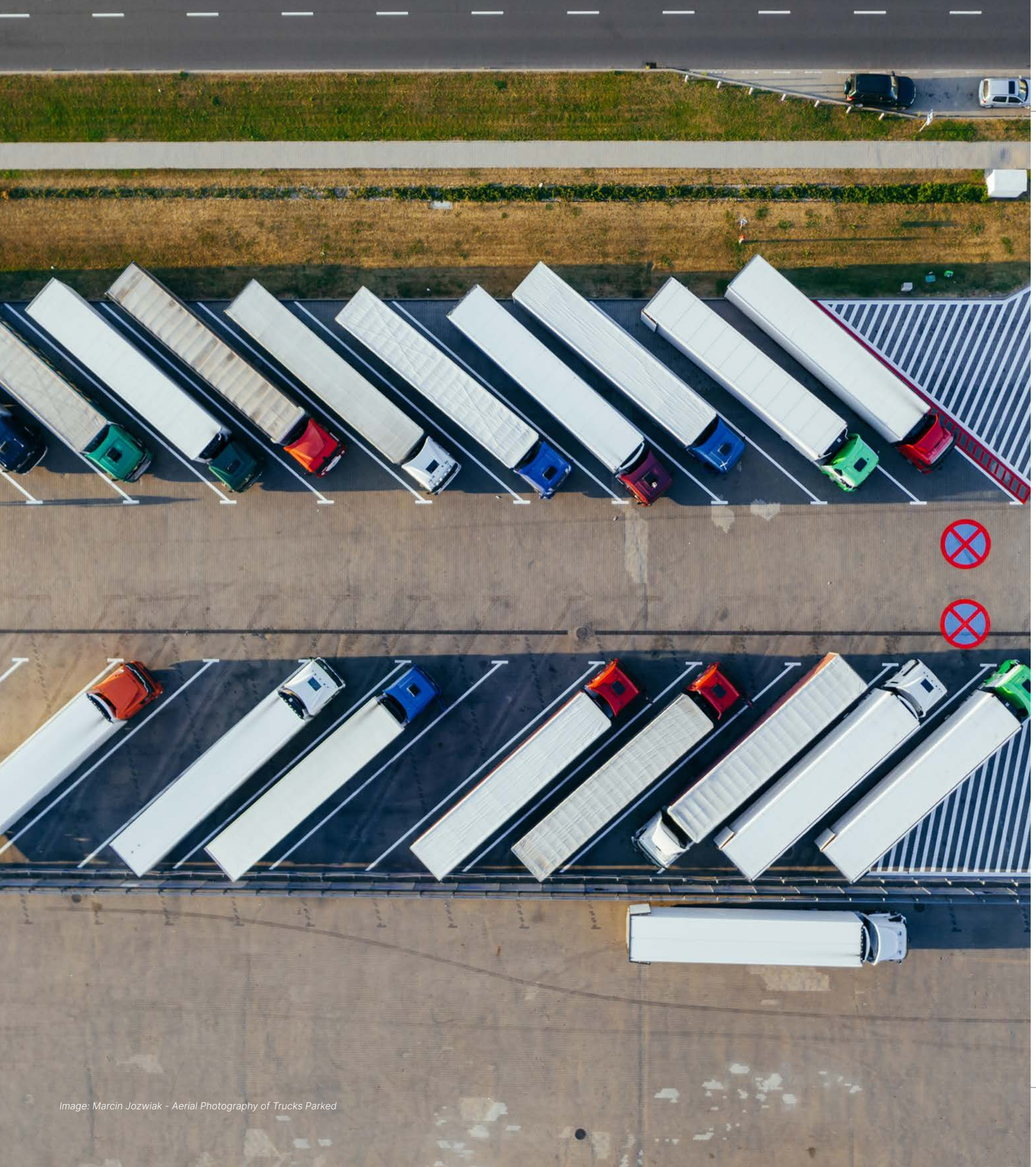


Image: Marcin Jozwiak - Aerial Photography of Trucks Parked

Conclusion

There are several options for cutting emissions from fuel consumption today, and more exciting opportunities coming in the near future.

This report synthesises the key solutions and technologies that will help the film and television industry achieve its environmental ambitions.

There is a significant role for battery and hydrogen technologies, more narrowly now and more vastly in the future. While these technologies continue to develop, HVO is a necessary lower-emission stop gap.

While long-term targets are rightly applauded, it is most important to take action on this transition today. For now, Euro VI vehicles and Stage V generators, fuelled by HVO should be considered the minimum for environmental standards within supply fleets.

Excitingly, London is well-equipped for this journey, with manufacturers and innovators continuing to bring low-emission technologies to the capital.

This is an industry that loves new technologies when it comes to image creation and should embrace the new tech within low emission power and transport in the same way.

Production suppliers are key to unlocking rapid emission reductions. It is hoped this report can go some way to ensuring these suppliers are an integral part of the conversation. It aims to support their understanding of the significant impact their next investment choices will have on the net zero ambitions of the industry and those of our city. It seeks to aid informed decision-making for their business and for the planet.

This is not the time to miss out on being the first with new gear and at the forefront of setting high environmental standards; action is needed today. While producers, scriptwriters, gaffers, actors and everyone else in our industry has a role to play, this report aims to create a helpful roadmap for suppliers to create immediate action towards the elimination of the 50% of our industry's emissions created by power generation and transport.

Where can I get further help?

Many organisations and resources exist to support the emissions reduction journey.

LOW EMISSION VEHICLES

- Energy Saving Trust Fleet Support – Gain a bespoke review of opportunities from independent, experienced fleet advisers.
- Zemo Partnership Fuels Group – A collaborative working group researching and disseminating future fuel sustainability for the UK.
- The Freight Portal – a UK-focused website dedicated to free independent advice on cutting emissions and costs from HGVs.
- Commercial Vehicle Finder – A web tool to identify suitable low carbon vehicles for commercial fleets.
- LoCITY – a Transport for London project creating a community of like-minded fleet operators to adopt and share information on low emission commercial vehicles. This includes a fleet advice web tool to help decision-making.

LOW EMISSION POWER GENERATION

- The Generator Project – a collaborative platform to connect the film and TV production industry with sustainable technologies, maintaining a list of available solutions and where to source them.
- The Grid Project – a collaboration between the film and TV production industry and the energy sector to establish mains power connections at unit bases.
- Energy Saving Trust NRMM Support – advice and market information on suppliers of low emission NRMM in the UK.

Thank yous

This report resulted from collaborative conversations between Creative Zero, Film London and industry stakeholders, with funding from Green Screen Interreg Europe.

It was authored by Alexander Lewis-Jones, Laurence Johnson and Roxy Erickson, with much influence and benefit from organisations that have worked on these subjects for a much longer time. The report is designed by Jordan Constantinides at silentcolours.studio.

The authors want to thank the many initiatives and companies who informed this report, contributed text from their reports and websites, and offered data and support. Film London and Creative Zero invite any suppliers and film industry stakeholders to reach out if they would like to collaborate on future projects.

While the entirety of the film and TV industry transforms to one that is environmentally and socially just, it is realised that more support for small and medium sized industry suppliers is needed so they can transition to a low emission way of working. We hope to take this support further.

ADF
Aggreko
Albert
Arri
BBC Productions
Carnival Productions
Energy Saving Trust
Geopura
Get Set Hire
Green Biofuels UK
Green Eyes Productions
Green Shoot
Green Voltage
Grip Van
Location One
Mallorca Film Commission
OnBio
Pixipixel
PlusZero
Road Transport Expo
Siemens Energy
Skoon
Sunbelt
Talick
The Generator Project
William F. White
Zemo Partnership
Zenobe

Special thanks to:

Endnotes

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