The Green Pages
NEW FUELS GUIDE
SUMMER 2023 • ISSUE 14

New mobile hydrogen bowser, refuelling solution

from Commercial Fuel Solutions®

As industry continues to decarbonise, looking to the future, Hydrogen will certainly have its role to play, especially when it comes to the commercial vehicle sector. This gaseous fuel will be fundamental for heavy transport and off-road applications. Commercial Fuel Solutions Ltd are one company who are looking to escalate Hydrogen's uptake and have already developed a reputation as an authority in this emerging sector.

Commercial Fuel Solutions® are pleased to announce the debut of our H35 Hydrogen Bowser, mobile hydrogen storage and refuelling system at this years Hydrogen UK conference in Birmingham.

Managing Director and system designer Robin Futcher, is an accomplished engineer with a wealth of experience spanning over 26 years. He has worked on a diverse range of projects, from developing equipment for the British Antarctic Survey to use in sub-zero temperatures, to providing systems for leading Formula 1 teams.

Robin also has extensive expertise in developing regulatory guidance. He currently serves on numerous technical committees for gaseous hydrogen fuelling, including BSI, British Standards Institute and ISO, the International Organisation for Standardisation.

Models are expected to roll off the production line before the end of 2023 and will be available in a range of sizes with varying capacities.

The new Commercial Fuel Solutions® hydrogen bowser is available to pre-order directly from Commercial Fuel Solutions® and can be tailored to suit your specific requirements.

https://l.ead.me/h2bowser

BP invests in Carbon Capture technology

BP has acquired a 40 per cent stake in the UK's Viking CCS project from Harbour Energy, as the government looks to accelerate plans to develop carbon capture and storage. The Viking project aims to meet up to a third of the UK's annual target of capturing 30million tonnes of carbon dioxide by 2030, by repurposing old depleted gasfields off the Humber region coast.

BP's own CO_2 emissions in its upstream oil and gas production totalled 307mn tonnes in 2022, and there are also plans to ship in additional CO_2 emissions from other parts of the UK and abroad through the port of Immingham.

BP's investment provides significant backing for a project that is among the leading contenders for the government's next phase of approvals, under its Track 2 carbon capture development process. The oil major will apparently absorb 40 per cent of the total costs, although terms of the overall deal were not disclosed.

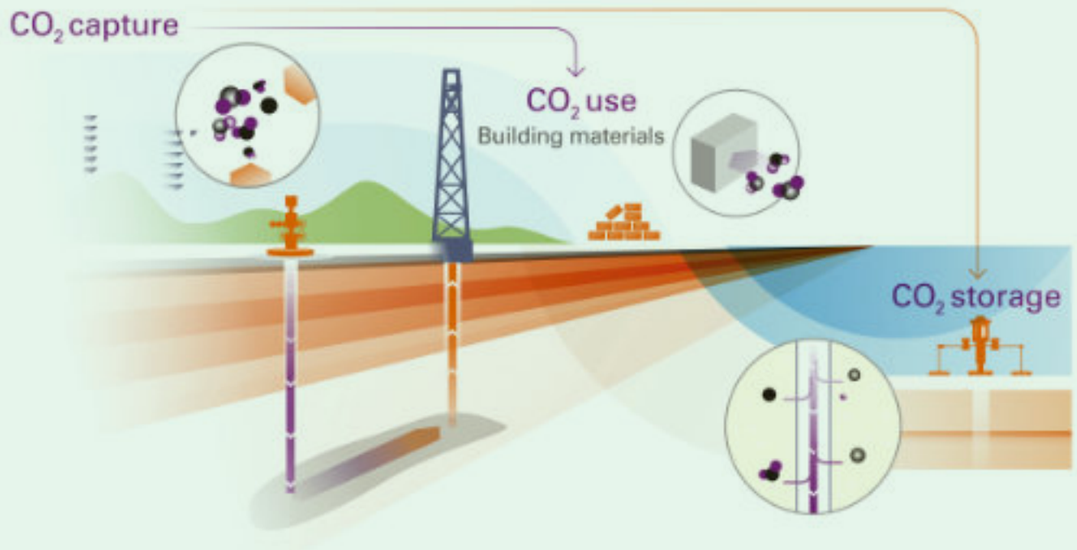
BP is already leading the East Coast Cluster as operator of the Northern Endurance Partnership on Teesside and the Humber, which is targeting cutting 23mn tonnes of CO_2 emissions a year by 2035. Harbour, the largest oil and gas producer in the UK North Sea, will operate the Viking project and retain a 60 per cent stake. But investing in Viking would give BP an additional back-up in its UK CCS operations, as well as opening up options such as shipping in CO_2 from overseas, a potentially higher margin proposition. Anja Dotzenrath, head of gas and low carbon energy at BP, said the company was *"excited"* about the project's potential for *"helping to decarbonise the UK"* and as *"a future CO_2 shipping destination"*.

EXPANDING GREEN TECHNOLOGIES

BP is looking to expand its investments in green technologies and renewable energy, although CEO Bernard Looney has come under pressure from investors to show technologies such as offshore wind and CCS can provide competitive profit margins when compared with oil and gas. Having reduced the company's focus on the North Sea in previous decades, BP has started to invest more in the UK again, focusing on offshore wind and carbon capture as part of its energy transition strategy.

WHY THE UK SHOULD BOOST CARBON CAPTURE

The UK government said in March that the Viking project and the Acorn project in Scotland were seen as "best placed" to be appointed in its Track 2 process, joining the East Coast Cluster and the Hynet North West projects that were selected in 2021 in the first round. The government's deadline for other projects beyond Viking and Acorn to submit proposals is April 28, otherwise, the two will be automatically selected. *"Our entry into Viking CCS demonstrates BP's commitment to Backing Britain through substantial investment and helping the country achieve its net zero goals,"* said Louise Kingham, BP's head of country for the UK. Harbour Energy's chief executive Linda Cook, who has been a fierce critic of the UK government's windfall tax on oil and gas producers, said the Viking project could *"unlock billions of pounds of investment across the full CCS value chain"*.



It's become a well-known addition to the net-zero conversation, but:

What exactly is carbon capture?

Carbon capture and storage (CCS) is a way of reducing carbon emissions, which could be key to helping to tackle global warming. It's a three-step process involving:

- Capturing the carbon dioxide produced by power generation or industrial activity
- Transporting it
- Then storing it deep underground.

Here are the potential benefits of CCS and how it works.

WHAT IS CCS?

CCS involves the capture of carbon dioxide (CO_2) emissions from industrial processes, such as steel and cement production, or from the burning of fossil fuels in power generation. This carbon is then transported from where it was produced, via ship or in a pipeline, and stored deep underground in geological formations.

HOW CAN CCS HELP PREVENT GLOBAL WARMING?

The Intergovernmental Panel on Climate Change (IPCC) highlighted that, if we are to achieve the ambitions of the Paris Agreement and limit future temperature increases to 1.5°C, we must do more than just increase efforts to reduce emissions. We also need to deploy technologies to remove carbon from the atmosphere. CCS is one of these technologies and can therefore play an important role in tackling global warming.

WHERE ARE CARBON EMISSIONS STORED IN CCS?

Possible storage sites for carbon emissions include saline aquifers or depleted oil and gas reservoirs, which typically need to be 0.62 miles (1km) or more under the ground.

As an example, a storage site for the proposed Zero Carbon Humber project in the UK is a saline aquifer named 'Endurance', which is located in the southern North Sea, around 90km offshore. Endurance is approximately 1 mile (1.6km) below the seabed and has the potential to store very large amounts of CO_2.

Similarly, in the US there are multiple large-scale carbon sites such as the Citronelle Project in Alabama. This saline reservoir injection site is about 1.8 miles (2.9km) deep.

WHAT IS CARBON CAPTURE, UTILISATION AND STORAGE (CCUS) AND HOW IS IT DIFFERENT TO CCS?

As well as CCS, there is a related concept, CCUS, which stands for Carbon Capture Utilisation (or sometimes this is termed 'usage') and Storage. The idea is that, instead of storing carbon, it could be re-used in industrial processes by converting it into, for example; plastics, concrete or biofuel.

IS STORING CARBON AS PART OF CCS SAFE?

According to industry body the Global CCS Institute, CCS is 'a proven technology that has been in safe operation for over 45 years'. It adds that all components of CCS are proven technologies that have been used for decades on a commercial scale.

WHERE IS CCS BEING USED ALREADY AND WHAT'S IN DEVELOPMENT?

According to the Global CCS Institute's 2022 report, there were 194 large-scale CCS facilities globally at the end of the year (compared to 51 in 2019) 61 of which were new CCS facilities added to the project pipeline in 2022. Thirty of these projects are in operation, 11 under construction and the remainder in various stages of development.

Of the total number of projects, 94 were in the Americas (80 in the U.S.) 73 in Europe (27 in the UK) 21 in Asia-Pacific and 6 in the Middle East.

The CO_2 capture capacity of all CCS facilities under development grew to 244 million tonnes per annum in 2022 – an impressive increase of 44% over the year.

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House of Commons
Transport Committee

Fuelling the future: motive power and connectivity

Here is an abridged summary of The House of Commons Transport Committee report from March of this year. It is based on the initial summary and conclusions from the minutes of the meeting and makes for very interesting reading.

You can contact our editor for a full copy, or read it at:
https://committees.parliament.uk/work/1711/fuelling-the-future-motive-power-and-connectivity/

SUMMARY

In July 2021, the Government published its Transport Decarbonisation Plan, which outlined the pathway for the transport sector to be net zero by 2050 in the UK. It reaffirmed the Government's commitment to decarbonising all forms of transport including maritime, aviation, road and rail, and stated that this will primarily be achieved by a combination of modal shift and alternative decarbonisation technologies.

The Government has repeatedly stated its position as "technology neutral" regarding the decarbonisation of fuel or technology chosen for each transport mode. This has apparently been a barrier to investment in decarbonisation technologies, due to the financial risk posed to private companies who invest in infrastructure for a technology that may not be the eventual 'winner'. The Government should change its policy to one of 'targeted technology investment', allowing it the flexibility to make strategic investments in new technologies that offer evidenced solutions to lowering emissions. This would give the private sector more confidence to invest in its own infrastructure.

SYNTHETIC FUELS

The potential of sustainable fuels (biofuels and synthetic fuels) has been overlooked in this debate. The key benefit of these fuels is their 'drop-in' capabilities, meaning they are usable in existing vehicles. They can be engineered over time to improve efficiency and reduce particulates and other emissions, while taking advantage of ever-more efficient engine technology. They can also be blended with fossil fuels until production ramps up sufficiently to replace them.

Various types of these fuels are already in production worldwide and have been used successfully in a variety of applications including motorsport, high-performance cars and an RAF test flight. The ability to provide existing private cars the opportunity to remain on the road for some time, with drop-in replacement fuels from renewable sources, seems a sensible and economically sound approach, making the best use of legacy assets. The current legislative framework, however, fails to capture the benefits of these fuels by focusing only on tailpipe emissions and not accounting for carbon savings elsewhere in the lifecycle.

EV?

The sidelining of sustainable fuels is particularly marked in the arena of private cars, where in contradiction to its stated policy of technology neutrality, the Government is currently succumbing to groupthink and putting all its eggs in one basket: battery EVs.

Not everyone will be able to afford to replace their current car with an EV, nor will everyone easily be able to charge one at home. There are questions over the adequacy of infrastructure and the use of raw materials to produce the necessary batteries. An exclusive focus on battery electric vehicles risks failing to meet the UK's climate goals.

The huge potential for sustainable fuels to provide a low-carbon option for conventional engines must be further explored. Reducing greenhouse gas emissions right now by using increasing quantities of drop-in sustainable fuels, would enable us to address the existing fleet and minimise cost, and carbon emissions, through the use of existing infrastructure.

Direction, guidance and regulation from the Department for Transport in respect of sustainable fuels is urgently required. A mechanism is needed to recognise the carbon savings associated with sustainable fuels which would incentivise investment and drive down costs, allowing automotive companies to provide the solution by applying the right mix of technologies.

ROAD

For cars and taxis, battery electric has already been chosen as the preferred decarbonisation technology. We also believe there is a case for many people right across the country in all areas, but particularly in rural and isolated communities, to continue to drive wholly diesel or petrol-powered cars, or hybrids (or EVs if they wish). Over time they will very likely account for a negligible proportion of transport emissions.

The cost of introducing EV charging infrastructure is completely unrealistic and will require massive amounts of taxpayers' money through government subsidy for electricity generation, infrastructure provision & storage, and basic raw materials, for battery production; in order to be anywhere near acceptable as an alternative to ICE or hybrid personal vehicles, delivery, farming or construction vehicles.

HGV'S

The biggest decarbonisation challenge for the road sector is Heavy Goods Vehicles (HGVs), which need significantly more power. In November 2021, the Government announced that the UK will become the first country in the world to commit to phasing out new, non-zero emission heavy goods vehicles weighing 26 tonnes and under by 2035, with all new HGVs sold in the UK to be zero emission by 2040. For lighter-weight goods vehicles that are travelling shorter

distances, battery electric appears to the most viable solution, but for heavier HGVs travelling long distances, there does not appear to be a single obvious solution. We recommend that the Government publish a long-term HGV decarbonisation strategy as a matter of priority.

MARITIME

The maritime sector presents a significant challenge to decarbonisation. It appears to be the furthest behind of the transport sectors in terms of technology readiness. The global nature of the shipping industry means international consensus on the chosen decarbonisation technology is required for alignment of infrastructure, and the longevity of vessels means that fossil fuel-powered ships built today will likely still be in operation in 2050. The UK Government should use its influence at the International Maritime Organization to ensure that, globally, the path forward for investors in alternative maritime fuels becomes more secure.

AVIATION

There will likely be significant remaining emissions in the aviation sector by 2050, due the limited decarbonisation options currently available. We were told that zero emission flight will mostly likely be achieved via hydrogen or battery electric. Both options, however, are currently only viable for short-haul routes and will likely remain so until after 2050. Sustainable aviation fuels (SAF) are the most viable option for the immediate reduction of aviation emissions. In July 2022, the Government published its Jet Zero Strategy, which introduced a SAF mandate that will require at least 10 per cent of jet fuel to be made from sustainable sources by 2030. We consider that further measures are needed to stimulate uptake of SAF. We recommend that the Government should introduce a Contracts for Difference model to support the commercialisation of SAF and create price certainty to incentivise further investment.

RAIL

Rail travel is a naturally low-carbon transport mode, but trains in the UK still heavily rely on diesel traction for their power. In 2018, the Government committed to phasing out all diesel-only trains by 2040, including freight trains. Electrification is currently the only decarbonisation technology that can deliver a full range of requirements including high-speed, long-distance passenger travel and freight haulage.

To achieve its decarbonisation goals, the Government must electrify the network at a faster rate. Electrification may not be viable on all routes, as the long-term benefits may not justify the high investment cost and level of disruption caused by engineering works; in these cases battery electric and hydrogen may provide a solution, but neither are currently capable of delivering the power required by freight and high-speed train services because of their high energy demand.

Biofuels may be the most viable option for decarbonising rail freight in the short and medium term.

We reiterate a previous recommendation that the Department for Transport publish a long-term strategy for decarbonising the rail network, including a vision for what proportion of the future network will use electrification, battery and hydrogen, and a credible delivery plan..

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CONCLUSION

Witnesses agreed that the Government has broadly been neutral in its approach to choosing which alternative decarbonisation technology is the best solution for each transport sector. However, we also heard that this approach in practice has resulted in a lack of guidance from the Government as to which technologies the private sector should be investing in, effectively slowing down the take-up of decarbonisation technologies and innovation in the sector.

There are challenges with increasing uptake of alternative fuels in the transport sector. Financial investment in zero and near-zero emission technologies, adequate production facilities and the introduction of market incentives to improve uptake will all be necessary for the UK transport industry to transition to alternative fuel power.

Prioritising investment towards alternative fuels that are proven to have the greatest effect on emission reductions, while providing value for money, will be the optimal way for the Government to distribute its finite resources.

The Government may not always be able to adhere to its technology agnostic policy as it seeks to achieve the target of net zero emissions by 2050. If that aspiration is to be fulfilled, it must introduce policies that enable a functioning market, which encourages alternative fuel uptake. That will sometimes mean 'picking winners'.
A technology agnostic approach from the Government should not be used as an excuse for doing nothing to lead.

The technology agnostic approach has led to a lack of investment in alternative decarbonisation technologies by the private sector. A more nuanced approach to increasing the uptake of alternative fuels is required.

The Government must shift its 'technology agnostic' policy to a 'targeted technology investment' policy. Such a policy will provide the Government with the flexibility to make strategic investments in new technologies that offer evidenced solutions to lowering emissions, while allowing the Government to maintain a level of neutrality on the emission reduction approach in transport sectors which are currently difficult to decarbonise.

CONCLUSIONS AND RECOMMENDATIONS

SUSTAINABLE AND SYNTHETIC FUELS

The case for full electrification in private cars is 'the received wisdom', and therefore needs further scrutiny and investigation. Given the existing private cars that will remain on the road for some time, drop-in replacement fuels from renewable sources could be a no-risk, very sensible and economically sound approach. Government needs to take account of legacy petrol and diesel-powered motoring and continue to explore the potential of alternative fuels where possible.

Maintaining an official line on technology neutrality with respect to achieving zero emissions in private cars, the Government is in fact 'putting all its eggs in one basket': battery EVs. The reality is that not everyone in the UK can afford a new or second-hand electric vehicle, and if they could, cannot easily charge one at home. The infrastructure is not adequate to deliver sufficient electricity to homes, and there are insufficient raw materials to produce the battery banks needed for all vehicles to be EVs. We therefore caution against the promotion of electric vehicles as being the only solution to reducing carbon emissions from private vehicles.

A reality check is needed. High-end premium and supercar manufacturers, and smaller specialised manufacturers, which have a much smaller construction carbon and pollutant footprint compared to EV manufacturers, need direction, clear guidance, and regulation from the Department for Transport.

While long-haul aviation and international shipping are often identified as the most likely users of sustainable fuels, we believe that the Government must open-mindedly consider all alternative fuels for all modes of powered transport, including private cars.
All the propulsion alternatives have a significant role to play, so the Government needs to stop demonising specific technologies that could really help. Addressing the existing fleet will be decisive in achieving the UK's climate goals. Reducing greenhouse gas emissions right now, by the use of increasing quantities of drop-in sustainable fuels, enables us to address the existing fleet and minimise cost (and carbon emissions) through the use of existing infrastructure.

It would also enable more socially equitable access to carbon reduction technologies for everyday transport, as it would not be necessary to buy a new electric car and have access to charging infrastructure. However, sustainable fuels still produce emissions at point of use so offer no 'apparent' benefit in the current, misleading, legislative framework.

We need a mechanism to enable the carbon savings associated with sustainable fuels to count, which would incentivise investment, drive down costs and offer a better-managed and complementary set of solutions.
The continued focus on battery electric vehicles alone risks failing to meet the UK's climate goals. Demand for more and more range from electric vehicles makes them very heavy and very expensive, tying up precious resources in

an energy store that might rarely be used. Distributing those resources across more plug-in hybrid vehicles with smaller battery packs, that enable 80 per cent of our journeys to be completed electrically, yet retaining extended range using an ICE running on a sustainable fuel, might be a better compromise.

The ideal solution may be to allow automotive companies to fix the problem, and provide the solution by applying the right mix of technologies. Plugin hybrids (petrol and diesel) offer the best options when, in urban areas, they can make a switch to electric propulsion on entry (such as at low emission zones) or pay the charge and revert back to ICE (on sustainable/synthetic fuels) propulsion if required. They can also utilise ICE propulsion outside of urban environments, where they are very efficient and 'cleaner' over long distances and/or at higher average speeds. Hence 'range anxiety' becomes a thing of the past.

ROAD

We recommended in our July 2021 report on zero emission vehicles, that some of the £950 million rapid charging fund be used to provide fully future-proofed grid capacity, and that the Government work with National Grid to map the electricity network, to assess potential weak areas. In October 2021 a proof-of-concept version of a National Energy Systems Map was published. We reiterate our previous recommendation, that this kind of information be used to develop a plan to prevent 'not-spots' in grid capacity from emerging.

We believe there is a case for many people right across the country in all areas, but particularly in rural and isolated communities, to continue to drive wholly diesel or petrol-powered cars, or hybrids (or EVs if they wish). Over time they will very likely account for a negligible proportion of transport emissions.
The cost of introducing EV charging infrastructure everywhere is completely unrealistic, requiring massive amounts of taxpayers' money through government subsidy for electricity generation, infrastructure provision and storage. Also basic raw materials for battery production, in order to be anywhere near acceptable as an alternative to ICE or hybrid personal vehicles, delivery, farming or construction vehicles will be extremely costly.

We recommend that the Government publish its future of rural transport strategy as a matter of priority. The strategy should include the Government's plan to ensure people living in rural areas have adequate access to charging infrastructure.

The Government should examine the roll-out of public charging networks in other European countries and in Scotland. They should asses how best to harness government expenditure on chargepoints—particularly in rural and more economically marginal locations—to help increase the pace of the rollout and increase coverage and EV-to-charger ratios.

HGV'S

There is not yet a solution for the decarbonisation of HGVs in heavier weight categories that travel long distances. We recommend that the Government publish a long-term HGV decarbonisation strategy as a matter of priority.

MARITIME

The UK Government should support the International Maritime Organization's work to develop global standards for vessel construction. This would enable ships to utilise alternative fuels such as ammonia, synthetic fuels and hydrogen. The UK should use its influence at the IMO to ensure that, globally, the path forward for investors in alternative maritime fuels becomes more secure.

AVIATION

There is significant demand and potential for sustainable fuels in the aviation sector; they are the most plausible option for significant decarbonisation of aviation in the short and medium terms. We welcome the SAF mandate in the Jet Zero strategy, but consider that further measures are needed to stimulate the progress required. The Government must introduce a Contracts for Difference model to stimulate uptake of SAF. The Government should also examine whether such a model could be used to incentivise the uptake of other sustainable aviation technologies such as hydrogen.

RAIL

Freight transport and high-speed rail are the most significant decarbonisation challenges in the rail sector. To meet its objective to phase out all diesel-powered trains by 2040, the Government must increase the current pace of electrification set out in Network Rail's traction decarbonisation plan. The lifespan of rolling stock alone means that any rail projects currently being developed that are not wholly electrified (such as East West Rail) place in doubt the achievability of the 2040 target.

As stated in our 'Trains fit for the future?' report, we recommend that the Department for Transport publish a long-term strategy for decarbonising the rail network as a matter of priority. This should include a vision for what proportion of the future network will use electrification, battery and hydrogen. That strategy should be supported by appropriate costings, a credible delivery plan, and enabling targets and milestones. These targets and milestones should clarify how the 2040 and 2050 targets will fit together.

CONCLUSION

The Government may not always be able to adhere to its technology agnostic policy as it seeks to achieve the target of net zero emissions by 2050. If that aspiration is to be fulfilled, it must introduce policies that enable a functioning market which encourages alternative fuel uptake. That will sometimes mean 'picking winners'.
A technology agnostic approach from the Government should not be used as an excuse for doing nothing to lead.

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Dover Fueling Solutions introduces DX Power™

to integrate EV chargers with the Prizma Ecosystem

Dover Fueling Solutions (DFS), a part of Dover Corporation is thrilled to announce the launch of DX Power™ within the European, Middle Eastern and African region. DX Power is a solution that integrates electric vehicle (EV) chargers with Prizma, DFS' connected mobility and convenience hub. This provides retailers with improved visibility and control, and customers with flexible payment options.

In today's fuel retail environment, most EV chargers run separately to the main point-of-sale (POS) and outdoor payment systems, resulting in customers requiring a roaming contract or registration to pay via charge cards. As a modular and open cloud-based platform, DX Power can interface with any EV charger and charge point operator to provide a frictionless customer journey. This solution seamlessly bridges the gap between EV chargers and the remaining forecourt system, helping streamline retail sites as they transition to supporting a new way of powering vehicles.

Raf Tormans, Senior Manager Product Management, DFS says;

"DX Power is a solution that can set a fuel retail business apart from the competition. It efficiently connects EV chargers, fuel dispensers, payment systems and your c-store; offering retailers increased visibility into their sales and providing customers with an effortless experience."

DX Power leverages the Prizma ecosystem and existing loyalty programs on fuel retail sites, to ensure EV chargers are included in transactions through the POS. This gives customers the additional ability to pay with cash, as well as traditional bank (credit or debit), local account and fleet cards. Facilitating the re-use of existing forecourt equipment DX Power, in conjunction with Prizma, optimises investments and provides site operators with clear visibility and control over payment options, and the status of EV chargers on their forecourt.

David Mc Guinness, Director Product Management, Electric Vehicle Charging, DFS commented;

"The energy mix in the fuel and convenience retail industry is changing. DX Power will help future-proof businesses, by allowing them to easily navigate the energy shift and ensure they're well prepared to serve a combination of customer needs. This solution further strengthens DFS's product portfolio around EV charging, following on from the launch of the Power UX™ 180 Electric Vehicle Charging System last year."

DX Power is compliant with applicable industry standards (OCPP and OCPI), European Union regulations and proposed Alternative Fuel and Infrastructure Regulations.

For more information about DX Power visit: www.doverfuelingsolutions.com/dxpower

For more information about Prizma visit: www.prizma-dfs.com/

For more information about Power UX 180 visit: www.doverfuelingsolutions.com/evchargers