

Sustainability of Renewable Energy With The Motor Industry

We know for sure that one of the known contributors to the world's air pollution is the result of fossil fuel powered vehicles, and it is a major concern for the modern-day world. It has led mankind in a search for renewable and safer natural resources that can be used to sustain future private and public transport. With the UK government announcing the country will ban the sale of petrol and diesel-powered cars by 2040, diesel remains the fuel of choice for 12 million motorists in Britain. This is having a profound effect on our environment. This high figure questions whether the UK Government, along with the car manufacturing industry are acting quick enough to move away from fossil fuels and finding greener and renewable alternatives to lead Britain to a sustainable future in motoring?

Statistics given by a number of car manufacturers show the percentage of new diesel vehicles being sold has had a huge impact in the market over the last 6 years. February's new car registrations show new diesel vehicles accounts for just 35 per cent of the market, with the figure previously being above 50 per cent. This dramatic decline is the cause of the domino effect spawned by the proposals and introductions to various diesel surcharges implemented by the UK government in the bid to discourage diesel motorists polluting the country.

During 2015, many European countries have acted upon the dangers of diesel, and enforced diesel bans across a number of city centres, with courts in Germany allowing Stuttgart and Dusseldorf to ban diesel powered vehicles due to the pollution levels recorded were found to be above the European Union thresholds of 40 micrograms of NOx per cubic metre. Rome is the latest major capital city to follow suit with the proposal to ban all diesel cars by 2024 from its historic centre. The immediate diesel ban is less likely to materialize within the UK, instead the UK government is expected to introduce the idea of charging zones within highly congested cities to limit or charge older fuel engines from entering during certain periods. Last year, an announcement made by the government confirmed the

country will ban the sale of petrol and diesel cars by 2040.

The mayor of London, Sadiq Khan has recently introduced such measures that apply to motorists of petrol and diesel-powered vehicles holding pre-Euro 4 engines, broadly those registered before 2005 who enter the city with an additional £10 charge to coincide with the existing £11.50 congestion fee during 7am to 6pm, Monday to Friday window to all motorists.

Similarly, to the congestion charges in London, Cardiff are also looking at implementing penalties for those motorists who drive through the city centre. Furthermore, an initiative by Cardiff city council has seen an attempt to make the suburbs of Cardiff, where a proposed new 'Garden village' is to be built. This proposal will mean the building of thousands of new houses, with this will come equally thousands of new cars that will further pollute the surrounding area and Cardiff. The proposal of the council is that there will be an exit from the village directly onto junction 33 of the M4, this will be for buses and public transport only. Car parking is provided for cars who will be using the affordable public transport in the intent to avert further pollution and congestion on our already crowded roads. Only one parking space is provided for each household, and with bollards being placed to prevent easy movement of cars. Provisions are also being made for the building of a newly proposed metro system in years to come. It is a well-known fact, that in order to entice motorists to leave their vehicles at home, it is imperative that there are good public transport alternatives in place.

The biggest myth perceived by the public is that the government is at war with the motorist. With the figures of speed cameras, road taxes fuel duty etc. on the rise, this would discourage the car user and increase the use of public transport. In 2010, the coalition government proposed to end such a myth if Labour were elected, with the shadow transport secretary, Michael Dugher, vowing he would champion the driver, and promised motorists that there will be a heavy focus on a range of issues that affect road users such as road improvements, the repairing of potholes, sky-high insurance and lengthy carriageway closures. Dugher has stated that his predecessors prioritized heavily on train users commuting into London. Noting only 5% of commuters commute via train, but 78% of people get to work by car, reiterating his desire to see through his promise.

However, it seems that the greater war is against the common public transport user. Information presented by the RAC Foundation suggest that the cost of a rail and bus travel ticket rose twice as much as the cost of driving in the past 10 years. Along with this dramatic increase, it is found that the public spending on roads over the past 5 years has been double the amount spent towards the enhancements on local public transport.

Within the EU, many countries have invested greatly in ensuring a strong public transport foundation, for example, Portugal offer a great service for commuters to travel via metro, bus, tram, funicular, ferry and suburban train at a very affordable rate with the use of a Viva Viagem card. The card is embedded with a chip, allowing a quick and easy process to pay for journeys on public transport in Lisbon, and far beyond across the country. Initially, the card costs €0.50 to purchase, and through the method of 'Zapping' which is directed towards the consumer who intends to travel often, the user can pay in a limited amount of up to €40 and has access to transport across a long duration of time. A single metro journey is an economical fee of €1.31, with an all-day ticket costing €6.30 across all lines. In addition to this, the access to a train is furthermore efficient, with the train line running through Estoril/Cascais/Sintra, combining into a 24.2km journey costs as little as €1.90 for a single ticket. Surely the UK government must consider a similar system in order to attract car users to leave their vehicles at home and lower the congestion on the roads.

The future of Renewable Green Energy.

A study has found that the increase in renewable energy such as solar farms and wind turbines means most electric vehicles (EV's) produce far less CO₂ than the most efficient petrol models found in the automotive market to date, promoting EV's as twice as green as they were five years ago. Environmentally conscious car owners aim to reduce their environmental footprint through converting to electric powered vehicles, with sales of pure EV's rising by 37% year-on-year.

With the figures rising at a rapid rate, Electrical vehicles still represents a small portion of the motoring industry, as the common analogy is that they are underpowered and mundane

along with range anxiety. However, manufactures such as Tesla and BMW are changing this perception and are now turning heads with the demand set to increase exponentially. The motoring industry is changing and are now on the verge of an electrical revolution. Volvo is one of a number of car manufacturing companies pledging to only sell electric or hybrid vehicles in the coming years, with Volvo announcing they will vow to carry out this statement in 2019. However, there needs to be a much-improved network of recharging stations to enable cross country travel using EV's so they are not limited to just commuting.

The technology behind an electric powered vehicle goes unnoticed to the average buyer. The electric batteries used utilizes large amounts of elements such as nickel, lithium and cobalt. In addition, large amounts of copper are used in their electric drive wiring. These materials are far less toxic than the current conventional batteries used with lead and acid, however, the impact can be seen in the process of mining these elements. The action of mining nickel comes with environmental and health concerns, with the release of sulphur dioxide in the surrounding areas. The drawbacks go further than utilizing the elements. The owner may not think twice when charging at a plug-in station, however in some instances, the procedure of producing the electricity that's fuels the vehicles may have a considerable environmental cost per mile if generated in a coal-fired powered station. Whilst an electrical vehicle doesn't have to factor in chemical emissions caused by a vehicles tailpipe, a consideration to the procedure of generating the electricity and its source needs to be taken into account to how green an electrical vehicle is perceived to be.

Alternatively, another renewable source of green energy is Hydrogen, and along with the right extraction methods, Hydrogen is known as one of the cleanest fuels that can be utilized in the vehicle industry. Hydrogen fuel cells run through a process where it reacts with oxygen resulting to yield electricity. Then harmful gases produced pass through an electrically charged permeable membrane, and the electricity generated through this process runs the car. Further, approximately 90 - 95% of the energy produced by the fuel cells is transformed into usable electrical energy, thus making these cars extremely energy-efficient. As a by-product, only water vapor and a minute amount of heat is realised into the atmosphere,

resulting in the prevention of pollution to a large extent.

It is proven through studies that a five-kilogram tank of hydrogen is enough energy to replicate the distance that most diesel-powered cars can cover of approximately 300 miles, a number that cannot be reached by an electric powered vehicle without having to recharge. The efficiency and performance of a hydrogen vehicle is evident, a kilogram of hydrogen provides almost twice the driving distance as a gallon of diesel, considering that hydrogen contains about the same amount of energy as that gallon. This is due to the use of high pressurised tanks carrying the hydrogen. Once it runs through a fuel cell nothing is burned, along with no combustion losses or heat wasted.

However, maintaining a hydrogen car could prove to be a stumbling block to many people, due to aspects of running such a vehicle is expensive for a working-class individual. Platinum is a crucial element involved in generating the fuel cells and transforming into electrical energy, due to its scarcity the cost is high. Once more, repairing any potential damage caused to the fuel cells will ensure maintenance to a hydrogen car is expensive.

Currently there is little infrastructure in place to allow hydrogen vehicle users easy access to refuel at many refuelling stations throughout the country. If the future of hydrogen power is to come to fruition, a willingness will have to be shown by the UK government to invest the money needed to make this proposal a reality. The automotive sector has pushed forward the concept of electric cars as the main greener alternative, although the proposal of hydrogen powered cars has been largely overshadowed. As a new technology,

undoubtedly, hydrogen would be the cleaner alternative. However, as the government drives forward with the investment in electric energy, the production of hydrogen is unlikely to ever materialize.

The findings within this report have shown that there is still a long way to go before renewable energy comes to the forefront of the car manufacturing industry. If the government continues on the current path of inadequately funding public transport – not making a pleasant and inexpensive experience for the commuter, people will still be attracted to use their cars, the choice will be the public's personal preference. However, it has been noted that the government will potentially lose a substantial amount of revenue, if there was a significant drop in the number of road users, forcing the government to find alternative means of tax income. This could be done by adding additional tax on the current price of electricity used to charge electric vehicles.

As consumers of vehicles are expecting a higher quality product, the high-end car manufacturers such as Audi, BMW and Volkswagen are embracing this new technology. However cheaper car manufacturers such as Ford and Vauxhall, are slow to adapt to the changes, and are subsequently falling behind their more expensive counterparts. This would suggest that the future of an affordable electric car is out of reach and will become more expensive for the average consumer.

Bibliography

Martin Saarinen. (2018). *Diesel ban? The future of diesel cars in the UK and beyond*. Available: <http://www.autoexpress.co.uk/car-news/consumer-news/98747/diesel-ban-the-future-of-diesel-cars-in-the-uk-and-beyond>. Last accessed 06/05/2018.

Martin Saarinen. (2017). *London T-charge pollution zone has arrived and will grow in 2019*. Available: <http://www.autoexpress.co.uk/car-news/consumer-news/95559/london-t-charge-pollution-zone-has-arrived-and-will-grow-in-2019>. Last accessed 06/05/2018.

Michael Cox. (2017). *Electric cars are twice as green as five years ago*. Available: <http://www.autoexpress.co.uk/car-news/consumer-news/100486/electric-cars-are-twice-as-green-as-five-years-ago>. Last accessed 06/05/2018.

Martin Saarinen. (2018). *BP will install electric vehicle chargers at UK forecourts*. Available: <http://www.autoexpress.co.uk/car-news/consumer-news/100349/bp-will-install-electric-vehicle-chargers-at-uk-forecourts>. Last accessed 06/05/2018.

Matt McGeehan CA. (2017). *Electric vehicles and the sustainability balance sheet*. Available: <https://www.icas.com/technical-resources/are-electric-vehicles-really-more-sustainable>. Last accessed 06/05/2018.

Terry Slavin. (2015). *Unless we stop driving cars, all other sustainable transport plans are pointless*. Available: <https://www.theguardian.com/public-leaders-network/2015/apr/29/stop-driving-cars-sustainable-transport-plans-pointless#comments>. Last accessed 06/05/2018.

Jason Beattie. (2014). *Labour car war is over- New transport chief's vow to help road users*. Available: <https://www.mirror.co.uk/news/uk-news/labour-car-war-over--new-4730050>. Last accessed 06/05/2018.

Unknown. (Unknown). *Viva Viagem Card: Use it on Metro, Bus, Tram, Ferry & Train*. Available: <https://www.lisbonguru.com/viva-viagem-card-metro-bus-tram-ferry-train/>. Last accessed 06/05/2018.

Unknown. (2018). *Weighing in on the Pros and Cons of Hydrogen Cars*. Available: <https://wheelzine.com/hydrogen-cars-pros-cons>. Last accessed 06/05/2018.

