

University Of Wales Trinity Saint David

Wales Institute of Science & Art



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Are Electric Vehicles The Future Of Motorsport?

Academic Skills (ACHA4005)

Joe Dashwood

2404498

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Contents

1. Introduction.....	1
2. Research/background	2
3. Discussion	3
4. Conclusions	5
5. References list.....	6

1. Introduction

Electric vehicles, while a potentially controversial topic in motorsport, have been around for nearly 200 years, with the first electric car, or “motorised carriage” as it was referred to being built in the mid to late 1830s by Robert Anderson in Scotland. Although vastly different to electric vehicles of the present day, the basic principle of a battery cell powering a drive motor has stayed the same in concept [1]. In this essay, the writer will explore the topic of whether electric vehicles (or EVs) are the future of motorsport, the current state of electric vehicles in motorsport, and how they differ from other conventional types of propulsion in motorsport, such as internal combustion engines (ICE).

2. Research/background

Although the first electric vehicles were created nearly 200 years ago, it would take until the late 90s for electric cars to come back into discussion. The EV1 concept from General Motors released in 1996 proving that electric cars could be a real competitor to ICE vehicles, and furthermore with cars such as the Nissan Leaf and Tesla Model S entering the market in 2011 and 2012 respectively, gaining mass market appeal and providing a useable range to consumers, which was a problem on early electric vehicles preventing them from ever being viable. Battery technology has improved significantly since then, with the current day Tesla model S having a range of nearly 400 miles according to Tesla. Shortly after in 2014, the first series of Formula E, the worlds first single seat all-electric motorsport started, with the first race being held at the Beijing Olympic Park. First generation cars could reach 140mph, with around 270 brake horsepower (bhp). A significant step forward was made to second gen cars, and the current third gen cars, at 174mph (335bhp) and 200mph (470bhp) [2].



Figure 1, GEN3 Formula E car

3. Discussion

Electric vehicles have a growing presence in motorsport, whether it's through completely electric vehicles, or hybrid systems, used in many different motorsport series, such as the completely Electric Formula E, and part time electric systems in cars competing in Formula 1, and the 24 Hours of LeMans, which bring in millions of spectators from around the globe year after year. Formula E specifically had a 35% boost in viewership on TV in 2024, up to 491 million total viewers worldwide, and 40 million viewers in a single race [3]. With an ever-growing fanbase through TV and social media, formula E has made a significant impact on the motorsport world, and has proven that electric vehicles have just as much of a presence in motorsport as ICE cars, and has created a fanbase of its own, with “bold ambitions and commitment to exciting racing” in the “fastest growing motorsport in the world” [4].

Electric vehicles have made their presence known in other forms of motorsports as well, such as the Pike's Peak International Hill climb, with the fastest time up the hill set by an electric vehicle, the Volkswagen ID.R, in 2018, driven by Romain Dumas. It cemented its time in the history books by being the first vehicle to complete the 12.42 mile track in under 8 minutes [5]. Volkswagen originally set out to just beat the record for the fastest electric vehicle up Pike's Peak, but managed to beat the overall record in the “unlimited” class. The same vehicle went on to generate lots of traction at other events such as the Goodwood Festival of Speed's hill climb, and similarly at the Nürburgring Nordschleife, generating a great amount of hype towards the future of motorsport with electric vehicles, and what is possible with the significant levels of torque electric motors can produce.

Electric vehicles also produce zero emissions while driving, and with climate change being such a prevalent topic at the moment, they help to promote sustainability in an industry that relies so heavily on fossil fuels.

However, there is also evidence to suggest that electrification will not be solely the future of motorsport, for example categories such as Formula 1, electrification is “simply not possible”. This is due to many factors, such as the distance F1 cars travel in a race, on average around 200 miles a race, which isn’t possible with currently battery technology at the speeds the vehicles travel [6]. As batteries are significantly heavier than an engine and fuel tank, battery technology needs to improve significantly before they become a viable source of energy in even relatively short events such as formula 1, and on a much larger scale for endurance motorsport such as 24-hour races, like the 24 hours of LeMans and the Nürburgring Nordschleife 24 hour circuit. This wouldn’t be so much of a problem if batteries didn’t take a long time to charge, but most electric vehicles take hours to get from a low charge up to just 80%, as charging slows down at a higher battery capacity, a process that takes minutes in a car running on regular fuels.

Furthermore, due to their silent nature, electric vehicles don’t provide fans with anywhere near the same experience from a purists’ perspective when going to view the events in person, or even online, generally motorsport fans enjoy the roaring sound of an petrol engine as cars fly past them on a circuit, and such feeling cannot be replicated authentically by battery powered vehicles.

Electric vehicles also pose a new safety risk with high voltage systems having the potential to cause large fires that are significantly harder to extinguish. Generally, electric vehicle batteries are Lithium-ion batteries, and as the name suggests, contain lithium – which is highly reactive with water even on a small scale, and can start a chemical reaction causing it to ignite, or potentially explode. It can be just as dangerous when pierced by metal fragments, which in a high speed motorsport accident is a real possibility and safety concern for not only the drivers, but also the spectators of the events.

4. Conclusions

To conclude this essay, the writer believes that while Electric vehicles certainly do have a place in motorsport in the future, with constant progression in battery technology and a growing fanbase for motorsports containing electric vehicles, it's very difficult to see a future where motorsports is dominated by purely electric vehicles. To many motorsport fans, internal combustion engines are the only way forward. Often electric vehicles can come across as soulless, due to their near complete silence and especially at higher speeds, the distance they are cable of driving reduces significantly, with no quick ways to recharge them to the same calibre as for example refuelling a combustion engine vehicle. Hybrid systems have an increasing role in motorsports, as the combustion engines can recharge the hybrid systems so that they can provide any of the benefits gained from electric vehicles, and are a more likely prospect for future and current motorsport endeavours.

5. References list

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