

VEHICLE ELECTRIFICATION

WHAT DOES IT MEAN
FOR THE AUTOMOTIVE
LUBRICANTS INDUSTRY



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The move towards electric and hybrid vehicles is a fast-approaching change for both the automotive and lubrication industries. The following article examines the driving factors leading the transition to electrified vehicles; lubricants role in these vehicles; and finally, the future state of our industry.

THE CATALYST FOR CHANGE: WHAT IS DRIVING THE AUTOMOBILE INDUSTRY TOWARDS ELECTRIC AND HYBRID VEHICLES?

Country leaders worldwide are increasingly looking to reduce the impact of climate change by reducing their greenhouse gas emissions. The scale of the challenge is significant. In the USA, vehicles¹ are the biggest source of CO₂, accounting for approximately 25 per cent of emissions¹, while in Europe, transport is responsible for 30 per cent of emissions².

Legislative changes

To tackle the issue, Governments have announced strict targets for transitioning to vehicles that depend less on fossil fuels. The UK plans to phase out diesel and petrol vehicles by 2040 in favour of electric and hybrid alternatives, while China plans to sell 4.6 million electric vehicles by the end of 2020 and ban cars with traditional combustion engines in the long term.

Vehicle Manufacturers and Consumer initiatives

To support these plans and the long-term future of the automotive industry, Original Equipment Manufacturers (OEMs) are seeking to reduce emissions by focusing on the development of innovative engine and powertrain technologies. Governments and car dealerships are supporting and encouraging the transition to electric and hybrid technology by offering incentives to consumers who purchase an electric vehicle.

As a result, the demand for electric and hybrid vehicles is increasing among traditional OEMs, as well as being fuelled by innovative manufacturers of alternative fuel vehicles such as Tesla, Nio, Lucid Motors and Rivian.

Societal appetite

Added to this, there has been a significant shift in awareness of climate change amongst consumers, with people more committed to recycling, re-using and consuming less to reduce their carbon footprint and impact on the environment. With the public tuned into their own production of carbon emissions, and concurrently calling for action to tackle climate change more broadly, appetite for measures that reduce emissions and the use of fossil fuels is steadily increasing.

Driving change

These combined factors have been the catalyst for global market share for electric and hybrid vehicles increasing year-on-year over the past decade. From a foundation of approximately 2,000 electric vehicles in 2005⁴, the market has grown rapidly, to approximately 2.4 million hybrid electric and 2 million electric vehicles out of a total 94.6 million vehicles sold³ in 2018. To put this into context, this equates to a global market share of 2.5 percent for hybrids and 2.1 percent for electric vehicles in 2018.

Electric car sales are expected to continue growing – in the UK alone, electric vehicles are projected to rise from 3.4 percent of all vehicles in 2019 to 5.5 percent in 2020 according to Bloomberg New Energy Finance⁵. This trend will continue in other parts of the world where electric powertrains are predicted to account for 9 percent of vehicle designs in North America and 20 percent of vehicle designs in China in 2031⁷.

WHAT ROLE CAN LUBRICANTS PLAY?

In an internal combustion engine, lubricants help reduce friction and provide vital protection to engine hardware. Hybrid vehicles still have an internal combustion engine so traditional engine lubricants will continue to play a key role in protecting the internal components of that engine.

Protection

However, electric vehicles have different lubrication requirements. While an electric motor doesn't require typical passenger car motor oils, there is still the need for lubricants to protect these vehicles. With entirely different motor architecture, which includes an electric motor, an e-axle (also called reduction gearbox), and other internal workings, electric vehicles present unique challenges that are not present in combustion engines. Those challenges include a fluid with balanced electrical properties, wear protection and compatibility with new materials.

Electric motors are also different to internal combustion technology as the motor spins at more than double the rotation speed of a traditional combustion engine and have instant top speed, causing significant amounts of heat to be generated. This makes the lubricant's ability to dissipate heat extremely important to prevent motor damage.

The lubricant also needs to be compatible and safe for use alongside components that are not in a standard combustion engine such as electrical components and new polymeric materials.

Driver experience

Lubricants also play a key role in improving the driving experience for electric vehicle owners. Electric cars are extremely quiet, and lubricants help keep the motor and e-axle running smoothly while helping to prevent any rattling or knocking which is particularly noticeable without any background combustion engine noise.

Added to this, the lubricant is required to be "fill-for-life" to reduce maintenance costs for customers as some components within the electric motor cannot be easily accessed, topped up or replaced.

HOW WILL VEHICLE ELECTRIFICATION IMPACT YOU AND YOUR CUSTOMERS?

The industry transition to alternatively fuelled vehicles will be gradual with the technology phased-in alongside further legislative changes. But electrification does not mean fully electric vehicles. Various forms of hybridization are expected to be the dominant powertrain going forward, coupled with an internal combustion engine.

The mildest form of electrification is designing cars to use stop/start technology where the vehicle shuts off when it is stopped. This involves a small electric motor being used to restart the engine when the owner pushes the accelerator. Although most would not consider this a hybrid vehicle, many OEMs are counting this as 'electrified' in their public statements.

It is recognized by both legislators and manufacturers that there needs to be time for the industry and supply chain to adapt and develop provision to sustain a momentous shift away from fossil fuels. For example, there is currently wholly inadequate public infrastructure in place, both in the UK and in North America to sustain a wholesale shift to electric vehicles. This phased introduction also provides time to educate your customers on the requirements of new vehicles, specifically how they're different to traditional vehicles with internal combustion engines.

The lubricants industry will need to diversify to provide unique solutions for the different types of engine technology – electric, hybrid and fuel cell – as the transition away from internal combustion technology evolves. Being agile, and ready for the industry changes will be vital to securing the future of your business and maintaining high levels of customer support through this period of significant change, where expert advice and support will be essential.

HOW WILL ELECTRIFICATION AFFECT LUBRICANT SELECTION?

Currently each OEM's electric axle lubricant is specific to the hardware. Differences between OEM motor architecture – design, materials used, internal components, operating units and parameters of electric motors - means that standardized lubricants and specifications are yet to be developed. And because the market share of these types of vehicles remains small, many OEMs are using off the shelf lubricants in their axles and transmissions, but this is expected to change as market share grows and develops. This means that reviewing the OEM owner's manual is vital before any lubricants are topped up or changed. Vehicle owners will also need to be even more diligent about their lubricant choices, which is where the role of the distributor will come into its own - as you can offer expert guidance and insight to help customers select the appropriate lubricant.

HOW IS PETRO-CANADA LUBRICANTS WORKING WITH OEMS?

At Petro-Canada Lubricants, we're working in partnership with various OEMs to develop unique lubricants based on the designs of their electric architecture. This collaborative process sees our expert Research and Development team working hand in hand with the OEM to formulate lubricants that are designed to provide superior protection for the motor's internal workings.

THE PACE OF CHANGE – WHAT ARE THE NEXT STEPS FOR THE INDUSTRY?

The transition away from internal combustion engines is a major shift for the industry, and the future is extremely changeable. But what's clear is that OEMs will continue to innovate and develop electric vehicle technology so that it can deliver the same quality of driving experience that we've become used to from internal combustion powered vehicles.

As the technology develops, the range and distance that electric vehicles can be driven between charges will increase, and the charging time will be reduced. This will speed up the adoption of electric vehicles in large countries – such as the US, where driving from one city to another is a considerable distance, and typically driven in a day, with quick refuelling stops.

In turn, this will also see the technology incorporated and used within other vehicles such as SUVs, larger passenger cars and vans as it becomes more established.

Electric charging infrastructure across North America will also continue to improve and encourage more electric vehicles to take to the road.

Longer term, electrification of passenger cars is likely to become more standardized as OEMs continue to innovate and consolidate. This will allow the charging infrastructure to be compatible with several manufacturer's vehicles, enhancing the driver experience and convenience of recharging on longer journeys. OEMs are also focusing their efforts in reducing the cost of ownership so that it becomes comparable to internal combustion cars, that will be an important factor for electric vehicles adoption.

These technological changes will likely be supported by new legislation and consumer initiatives that aim to increase the pace of transition away from internal combustion engines toward alternative fuelled vehicles. And with all these factors in place, societal appetite and the consumer 'norm' will gradually become electric and alternative fuelled vehicles – however, how long it will take to truly transition away from vehicles run on fossil fuels is yet to become clear.

WHAT WILL THE INDUSTRY LOOK LIKE 20 YEARS FROM NOW?

There are still a number of challenges to overcome before rapid expansion of the electric motor industry, as Mark Reuss, the General Motors president, recently wrote, "just as demand for gas mileage doesn't go down when there are more gas stations, demand for better range won't ease even as charging infrastructure improves."⁶

As the technology matures, there will likely be a technology front runner which begins to dominate the market, but as we're in the early stages of the transition and technology is developing rapidly, they are yet to emerge. This period of change presents a number of opportunities for diversification and business growth – but to do this successfully, it's important to stay on top of the latest trends in electric motor vehicles and alternative fuelled engines, and their lubricant needs. To ensure you offer your customers the best service and support, there are three steps that you can take now:

1. Discuss your plans for expansion into electric vehicle lubricants with your lubricant partner
2. Share your expert insight and guidance about electric vehicles with your customers to position your business as an industry leader
3. Keep up to date with industry trends and news shared by industry thought leaders and key publications

SOURCES

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