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The expert view: maximising energy efficiency and performance in hybrid and electric motor vehicles



The shift to electric vehicles is both inevitable and necessary but, as recent attendees at a Business Reporter breakfast briefing made clear, the path is far from straightforward

Siemens was making electric vehicles and batteries a century ago, the company's Brian Holiday told a Business Reporter breakfast briefing at The Ritz hotel in London. Although electric vehicles didn't catch on back then, the time is finally right for the technology, he told attendees, senior executives from across the automotive sector.

The challenge for today's automotive businesses is navigating the transition from internal combustion engine (ICE) vehicles to electric vehicles (EVs). During the discussion, three main areas were highlighted as particular concerns: maximising energy efficiency while still meeting customer expectations, navigating changing regulatory landscapes, and reskilling and upskilling workers as manufacturing complexity increases.

Meeting customer expectations

All attendees were clear that the shift to EVs is both inevitable and necessary. However, several warned that customer expectations represent a challenge for manufacturers. As one attendee estimated, an EV or hybrid vehicle costs up to £12,000 more than an equivalent ICE and most of the market is not willing to pay that premium for a more environmentally friendly vehicle, even if it is

more efficient and cheaper to run in the long term.

Customers don't buy energy efficiency, said one attendee from a luxury car manufacturer. Instead, they want the same range they get with an ICE vehicle and expect the latest features inside. Furthermore, the current trend is for SUVs, which are not ideal EVs because their size and weight requires a bigger, heavier battery, which pushes up the price. There's little scope for automotive companies to drive that price down because 75 per cent of the cost of a battery is the raw materials.

As an attendee who works in Formula E racing put it, the essential features for car performance are mass, aerodynamics and power train efficiency. But, he said, car buyers have become distracted by unnecessary bells and whistles.

So long as customers make purchasing decisions based on interior features such as the entertainment or navigation systems, and expect vehicles to have the range to make their longest journey, making EVs mainstream will be a struggle. In time, attendees agreed, the market must shift towards buying an EV that suits a customer's average journey and renting a bigger vehicle for the occasional longer journey.

The regulatory push and pull

Although customers don't buy based on efficiency, they are worried that their SUV might be banned from city centres by emerging "green zones". Regulatory shifts such as this are just one example of

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how governments might shift consumer behaviour, some attendees suggested.

Green zones could also be another opportunity to ramp up EV production, because service vehicles will have to meet emissions standards too. Those fleets can be shifted to EVs without the need for infrastructure to catch up because they can be charged at the depot between trips.

However, although regulatory shifts could accelerate change, they might also add complexity for manufacturers. One attendee argued that more safety features are likely to be mandated by regulations. Just as ABS was once a safety option and is now a requirement, features such as lane assist and automatic braking could one day be mandatory. Manufacturers will have to accommodate these changes and still deliver vehicles that customers want and at a price they can afford.

Manufacturing challenges

Changes to regulations are far from the only complexities manufacturers will have to manage. Like many sectors, the automotive sector is becoming a software business. Many attendees expressed admiration for the way Tesla fixes problems, adds features and even extends range with over-the-air software updates. One delegate said his company employs around ten times as many software engineers as it did a decade ago.

Integrating these workers with existing teams and processes is difficult, but even harder is finding sufficient numbers of qualified people. Talent is scarce and although British government investment into universities has boosted the number of qualified workers, there is still a question of whether the UK can match the scale of China, the EU and the US.

Businesses can solve some of these problems with automation, said Holiday. He pointed out that in the UK there are 32 factory robots per 10,000 workers, compared with 170 per 10,000 in Germany. The automotive sector can go further in its use of technology.

EVs and the electrification of society

Support from suppliers is a different matter. One attendee, from a car maker, argued that the EV supply chain is immature and suppliers are often not able to deliver at a cost that works for manufacturers. He said suppliers need to collaborate so that

they can cut costs. However, an attendee from a supply chain firm argued that OEMs often don't share as much information with suppliers as they could. He gave the example of a major manufacturer that brought his firm into a project when it was well advanced and explained that, had they been brought in earlier, they could have delivered the project at a significantly lower cost.

Of course, the automotive sector cannot do this alone and the electrification process is part of a wider societal drive towards reducing emissions. Car makers need government support and help from companies in their supply chain. Many consumers are reluctant to buy an EV because of the lack of charging points. However, as one attendee argued, this will come as more vehicles are sold, and those cautious buyers will gradually be convinced to switch from ICE vehicles. Governments can help to speed up this process by encouraging investment in the charging infrastructure and offering greater incentives for switching to EVs.

One concern attendees expressed about government support was that falling tax revenues from petrol and diesel fuel could lead to spending cuts. However, other attendees argued that, in time, declining tax revenues will be balanced out by a reduction in subsidies for the oil and gas sector. It's also possible that new revenue opportunities will open up once EVs become mainstream.

All of this has been seen against a wider background of society-wide electrification of every sector. For example, one attendee explained that the data centres on which so much of the digital world depends rely on power from vast numbers of lead acid batteries. Over time, these could be replaced by recycled batteries from EVs, which are no longer able to cope with the demands of a vehicle but would be able to work for decades in the less demanding data centre environment. This would be just one factor that would offset the costs of making new batteries.

Despite the significant obstacles to producing vehicles that maximise both energy efficiency and performance, everyone at the briefing was optimistic. Industry investment in EVs is still increasing and the automotive sector will benefit from electrification of other sectors.

The destination is clear and there is little doubt that we will get there. But we are still at the beginning of the journey.