WHAT GERMANY NEEDS FOR E-MOBILITY TO SUCCEED

The European Union has issued guidelines enshrined in a series of directives targets and roadmaps to tackle climate change, primarily through a reduction in greenhouse gas emissions. The EU guidelines specify ambitious decarbonisation goals for Member States. Notwithstanding the fact that the German Federal Government has already adopted a broad programme to implement European agreements, it was clear that Germany would not be able to reach the European targets, in particular the 20/20/20 targets, without taking further action. The German Federal Government launched a new and comparably ambitious plan to address another important source of greenhouse emissions: transport. The aim was to make Germany the leading market for electric mobility, with one million electric cars on the streets by 2020.

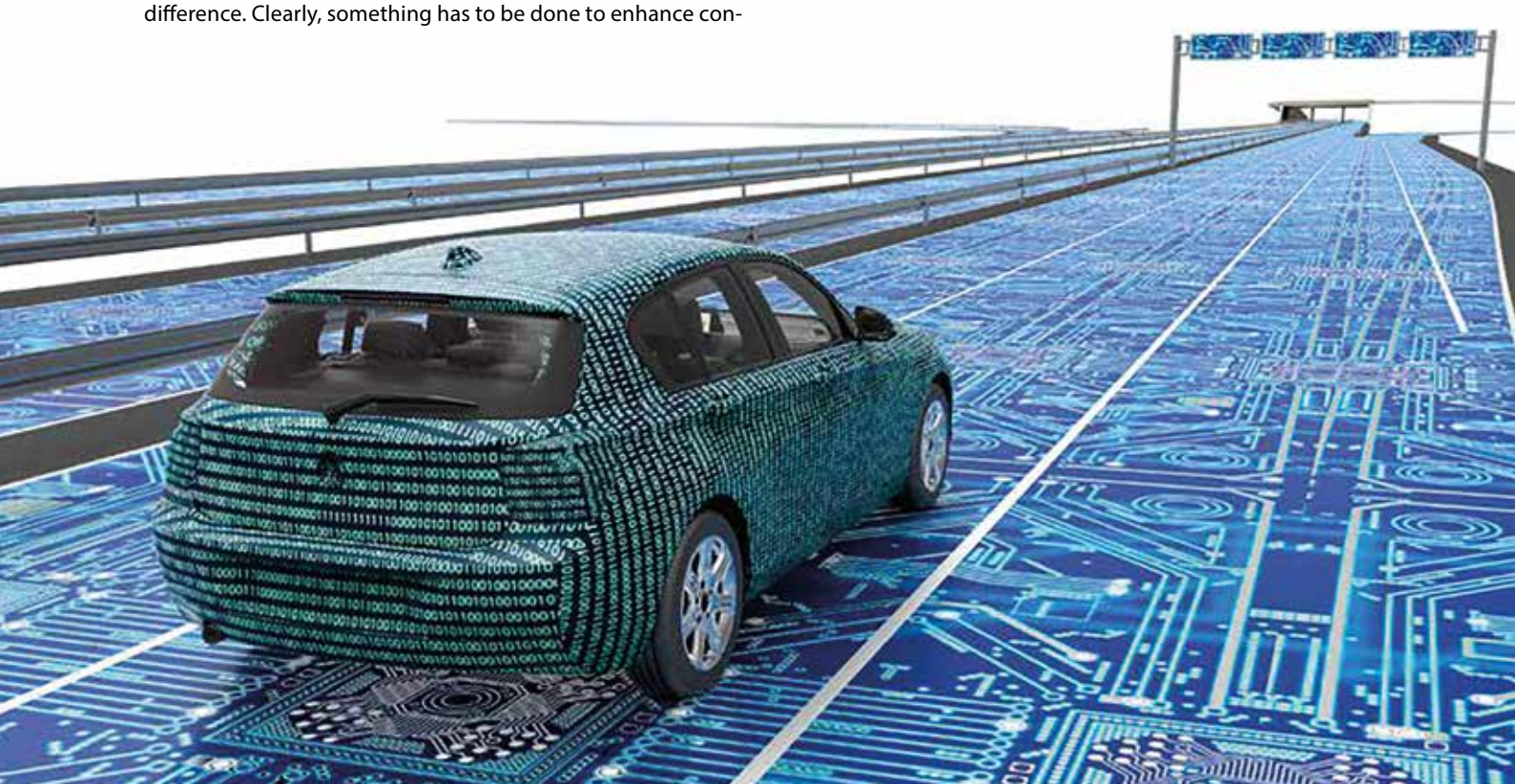
With less than 54,000 e-vehicles on the roads at the beginning of 2018, Germany's government is nowhere near reaching its goal. In 2017, the country recorded some 3.5 million new car registrations, of which e-vehicles accounted for approximately 0.7 percent. All else being equal, this number would need to increase to 14% per annum in each of the next two years to achieve the one-million goal on time.

It is obvious that Germany is not going to meet the 2020 target. Neither initiatives such as the 'environmental bonus' – a government subsidy of up to 4,000 euros for newly bought electric cars – nor the steadily but nonetheless slowly expanding charging station infrastructure will be enough to make the difference. Clearly, something has to be done to enhance consumer acceptance of e-cars and to boost sales to significant volumes. But what?

BDO commissioned a Delphi study to find answers to this pressing question and to provide insights on how the future might look. Independent experts from various institutions were asked to 1.) identify and assess current and future obstacles to faster electric car market penetration and 2.) suggest which promising supply- and demand-side measures they believe are most likely to promote e-mobility in Germany.

So, what barriers do the experts see? There are three main market players that will determine e-mobility's success: government, consumers and the automotive industry. The experts argue that as of today the political will to push the relevant technology is low. Existing legislation for traditional motor cars lacks clarity, especially concerning emission compliance. The current discussion in Germany about diesel-engine car emissions and possible driving bans by some cities on certain types of diesel engines is probably proving them right.

Sales of e-cars are not being driven by consumers either. They are showing a lack of enthusiasm for electric cars and there are several reasons for this. The main reason is the high price of electric cars compared to traditional diesel and/or petrol engine cars. The mark-up for e-cars is substantial. Concerns about



poor range, lengthy battery charging times and an inadequate charging station infrastructure are further discouraging potential buyers from switching to e-cars. It is clearly not an attractive proposition for market-driven businesses to develop and produce cars hardly anyone is going to buy. This probably explains the German automotive industry's limited enthusiasm to switch to new e-models.

All the experts agree that the financial incentives for consumers in Germany are inadequate and have to be improved. Examples in other countries like Norway show that higher tax breaks or premiums offered to consumers on the purchase of an e-car can support the switch to electric motors. However this is not going to be enough to get the car industry to become a driving force. Both business and consumers need certainty and consistent policies to be able to make the necessary investment decisions. Legally binding targets and measures are needed if e-mobility is to succeed in the long run.

The short- and medium-term solutions that the experts suggest to force electric cars into the market include stricter limits on carbon dioxide emissions, registration bans on combustion engines and registration quotas for e-vehicles.

Government initiatives on their own will not be enough. Car manufacturers and suppliers need to change and make a contribution, too. More affordable and attractive e-vehicles need to be developed to help the German automotive industry extend to e-mobility its existing reputation as a global pacesetter. The experts also call for increased R&D and for new strategic alliances between German manufacturers to create more advanced batteries.

Similarly, even though the experts are convinced that less expensive, technically advanced electric cars will drive growth in new electric car registrations, they do not think such measures will be enough on their own. Access to electricity via an adequate charging station infrastructure is the most important prerequisite to drive e-car sales significantly higher. The number of charging stations needs to be increased substantially from today's levels. Just as the public can access private wireless internet access points, the public should also have access to private charging stations. Likewise, smart concepts have to be developed to be able to manage an increasing and volatile demand for electric power.

To reap the maximum reward from all initiatives and changes, the experts emphasise the need for an integrated approach to e-mobility and the German energy transition. A combination of such initiatives is the most likely way to produce the optimum results across the entire value chain.

Automation and digitisation are the key words that encapsulate what needs to be done by the major players. This applies to energy suppliers and power grid operators, as well as car manufacturers and their suppliers. Innovative transport concepts and smart traffic solutions combined with increased car sharing can help foster more than just e-mobility; they can also significantly reduce overall traffic and the emission of associated greenhouse gas, as well as other traffic-related pollutants, particularly in metropolitan areas.

The experts who participated in the Delphi study regard e-mobility as a long-term technology that can contribute to climate protection. Plus, its positive effects on air quality in densely inhabited cities are unquestioned. Nonetheless, the overall contribution of e-mobility to curbing global greenhouse gas emissions is expected to be somewhat limited. Looking ahead, it will be a long time before many regions in the world have the necessary infrastructure for charging electric cars. Some of the natural resources used in batteries are finite, which creates a further limitation. Plus, it is not feasible to power heavy commercial vehicles, trucks and busses with currentbattery technology.

The experts urge all market players to be open to other technologies that can be used to reduce CO_2 emissions caused by road traffic to desired levels. For example, they recommend further improvements to combustion engines to at least help bridge the gap to emissions targets. They view the fuel cell, in particular, as a viable alternative to battery-based e-mobility. Both hydrogen and methanol, which are used in fuel cell technology, can be produced with renewable energy, such as wind or solar power. They can also be stored and transported much more easily than electric power. This technology could be a real alternative, particularly for regions whose charging infrastructure is likely to remain insufficient for the foreseeable future. In short, fuel cell technology's potential contribution to traffic-related climate protection should not be underestimated.

To summarise: the experts are calling for a combination of measures to make e-mobility a success in Germany pending a necessary breakthrough in battery technology. In particular they identify the promotion of alternative drive technologies, greater investments in charging infrastructure, and a robust regulatory framework as key.

The full results of the study can be found here:
www.bdo.de/e-mobility

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