



# “What comes out the back is all that matters.”

Following the climate summit in Paris, decarbonization is the new global goal – including for the automotive industry. But how can the industry achieve emission-free transportation? A debate between Dr. Ulrich Eichhorn, Head of Research and Development at the Volkswagen Group, and Dr. Axel Friedrich, cofounder of the International Council on Clean Transportation (ICCT) and one of the whistleblowers in the Volkswagen exhaust gas scandal.

**Dr. Elmer Lenzen:** Dr. Friedrich, Dr. Eichhorn, it seems that even the darkest cloud has a silver lining. Since the emissions scandal, the industry has been calling for a change of direction – toward electromobility.

**Dr. Axel Friedrich:** What counts is action. So far, the auto industry has only tried to put the brakes on Brussels.

**Dr. Eichhorn, how serious is your commitment to decarbonization?**

**Dr. Ulrich Eichhorn:** Very serious. And not just since yesterday. We’ve had electric vehicles at Volkswagen for more than ten years already. But now, as then, the prerequisites for their market success are lacking.

**Would the market breakthrough of e-cars be a dream**

**come true for you, Dr. Friedrich?**

**Friedrich:** No, because it’s not the drive technology, but the well-to-wheel balance that matters. The CO<sub>2</sub> emitted by power plants can ruin an e-car’s life cycle assessment. In the interest of the environment, the main priority is to rapidly reduce overall emissions. So we need to define clear intermediate targets for 2025, 2030, and 2040. In the process, the industry still has to earn enough to shoulder the necessary investments for research and development.

**You’re forgetting the customer. Fuel is cheap and SUVs are comfortable. Why change?**

**Friedrich:** What the German auto industry spends on advertising in a single day is the equivalent of the annual budget of the German Environment Agency

(UBA). The two sides just don't have equal fire power. And the policy framework needed to create the product range is missing – thanks to an exceedingly influential auto lobby.

**Eichhorn (laughs):** That's balanced out when a department head from the UBA switches to the side of the environmental groups.

**Friedrich (smiles):** Well, sure, I've done my part – both here and there.

**Eichhorn:** Hardly anyone needs an SUV, but more and more people want one. We live in a market economy and we don't want to and can't reeducate our customers. The most environmentally friendly car is no good if no one buys it – just think of our Lupo that goes one hundred kilometers on three liters, or our natural gas vehicles.

**The EU wants to take the decision for or against an e-car out of the hands of customers and is talking about a fleet limit of 75 grams of CO<sub>2</sub> per km for 2025. Are there still conventional internal combustion engines in your portfolio?**

**Eichhorn:** Just to get to 95 grams by 2020, we're going to need electrified or CO<sub>2</sub>-neutral fuel-powered vehicles.

**Fleet limits or rewards – what is the right way to achieve transportation reform?**

**Friedrich:** We need a technology-independent efficiency standard that emphasizes energy consumption over the vehicle's entire operational life. At 37 kilowatt-hours per 100 kilometers, a Tesla isn't eco-friendly – it's a power hog. Customers need clarity to be able to decide between technologies.

**Vehicle weight is decisive when it comes to efficiency.**

**Eichhorn:** We're struggling constantly to reduce weight, testing alternative materials and putting a lot of money into lightweight design.

*“Very few customers opt for the most economical model.”*

**Dr. Ulrich Eichhorn**

**Friedrich:** While engines and tires keep getting bigger and heavier.

**Eichhorn:** This weight spiral is also being driven by legislators, to make vehicles safer. And, of course, by customers' wishes.

**Friedrich:** But the customer can't freely configure his car. If you want to have air conditioning, you need a big engine.

**Eichhorn:** The truth is that very few customers actually opt for the lightest and most efficient version of a series.

**Is the diesel still necessary for climate protection?**

**Friedrich:** No. A gasoline-fueled vehicle in the same price range can have even better fuel economy than a diesel. In the 1.7- to 1.8-ton weight class, diesel hasn't made any sense for years.

**Eichhorn:** For long-haul drivers, it still pays to drive a diesel.

**Friedrich:** Wrong. The preference for diesels is irrational. People are subsidized for driving a lot, and that isn't a reasonable solution in the long term. We need fair conditions for everyone – whether they drive on gasoline, diesel or natural gas. I'm also only interested in what comes out the back.

**Eichhorn:** But the diesel driver pays a higher automo-

**Dr. Ulrich Eichhorn,** 54, studied at the Technical University of Darmstadt before beginning his career in the automotive industry, which has included positions in Germany, the United States, and Britain. In 2012 Eichhorn became a Managing Director at the German Association of the Automotive Industry (VDA). This year he assumed responsibility for Volkswagen Group Research and Development.





**Dr. Axel Friedrich,**

69, studied chemistry at the Technical University of Berlin and worked for the German Environment Agency for 28 years. He is a cofounder of the International Council on Clean Transportation (ICCT) and today serves as a consultant to governments, international organizations, and environmental groups around the world. He recently received the German CSR Award as the “whistleblower of the Dieselgate affair.”

bile tax. For a long time now, the fuel has been taxed less heavily so that companies aren't put at a competitive disadvantage.

**However, diesel has a nitrogen oxide problem. Cities are raising the alarm and the so-called blue badge is being discussed at the federal level, but no time frame has been set. What do you think of this idea, Dr. Eichhorn?**

**Eichhorn:** A sticker for Euro 5 and 6 makes a lot of sense. But I think nitrogen oxide values will sink anyway as fleets are renewed. Often, intelligent traffic control would be enough.

**Friedrich:** That's just not true. The “green wave” won't help much at all. Cities can't wait for eco-friendly models to come out. I don't understand why the auto industry so reflexively rejects the blue badge system. It's a stimulus program: owners have to upgrade their present car or buy a newer, cleaner model.

**Eichhorn:** The Audi A3 is already under the NO<sub>x</sub> limit, even in actual on-road driving ...

**Friedrich:** ... as is the Passat. Which goes to show that modern diesel vehicles can comply with the limits. And if a software update gets you an 80% NO<sub>x</sub> reduction, it's hard to justify not doing it. Then, a slight increase in the CO<sub>2</sub> levels would also be tolerable. Unfortunately, the policymakers don't understand the trade-off between exhaust gas reduction and increased consumption – we should explain that to them together.

**Eichhorn:** There used to be an upgrade incentive for Euro 2 vehicles ...

**Friedrich (smiling):** I came up with that.

**Eichhorn:** I know. Now, anyone who upgrades their Euro 5 diesel with an appropriate exhaust after-treatment system should receive the blue sticker and be allowed to drive in the city center.

**Environmental groups have proposed doing without**

**laboratory tests during type approval and taking measurements on the road only.**

**Friedrich:** New methods have been invented repeatedly over the years without abandoning the old ones. That costs money and creates unnecessary emissions. In the near future, the RDE test will dictate the design of the vehicle. I'm still waiting for the first manufacturer to support our proposal.

**Why not Volkswagen, Dr. Eichhorn?**

**Eichhorn:** In fact, the NEDC reflects the state of the art of 25 years ago. The WLTP is better, but doesn't change the fact that the driver, not the vehicle, is the biggest factor affecting consumption. RDE is a big challenge for us because of the difficulty in reproducing PEMS measurements – you'd have to drive the route ten times and take the average, but we aren't allowed to do that. The worst value is the one that counts.

**Friedrich:** Absurd rules have been created here. If anything good has come of Dieselgate, it's the fact that we can talk about such regulations now.

**Let's get back to the innovation barriers: how do we get our act together on e-mobility, Dr. Eichhorn?**

**Eichhorn:** Customers are hesitant because of the poor range of battery-powered vehicles, the lack of charging infrastructure and the high prices.

*“What good is a plug-in hybrid when it's constantly driven in gasoline mode?”*

**Dr. Axel Friedrich**

The first two points will improve soon. The high cost of batteries will, however, make BEVs more expensive than conventional cars for maybe the next ten years. And today's list prices don't even reflect the additional costs.

**Friedrich:** No one earns money with electric vehicles. The Netherlands, Austria, and even India plan to discontinue approval of internal combustion vehicles in the near future. Is that a solution?

**Friedrich:** How will an Indian, who can spend 3,000 euros on a car today, be able to afford a BEV for 35,000 euros tomorrow? And as an environmentalist, I can't condone subsidizing car purchases with up to 12,000 euros – as is being suggested in Norway. Why not offer people a rail card? That would certainly be more efficient. It may be justifiable for industrial policy reasons to promote a technology to prevent being left behind. But permanent subsidies are rarely good – we need solutions that are ecologically appropriate, economically reasonable, and socially accepted.

**Eichhorn:** The plug-in hybrid is a step forward ...

**Friedrich:** ... if it were highly efficient in internal combustion operation. But not if the car consumes seven liters [per hundred kilometers] and almost always drives on gasoline. With regard to the limited life of the batteries, too, maybe electrification using smaller batteries should initially be encouraged. That would allow you to get ten, fifteen kilometers of emission-free driving and the costs would remain reasonable.

**Eichhorn:** The hybrid only makes sense if it's also driven electrically. The Federal Government's incentive program can help us reach a volume great enough to give rise to a used car market.

**Friedrich:** Instead of promoting a technology, it would have been far more useful to have a promotion based on efficiency, that is, on CO<sub>2</sub>.

**Eichhorn:** Of course, a modern gasoline or diesel automobile can be just as efficient as an electric car. So we'll continue our research and development in that area, too. What market share will electric cars have by 2030, and which country will have created the best conditions for this?

**Eichhorn:** Worldwide, we could be at ten to fifteen percent. In Germany, Europe, and China, significantly higher.

**Friedrich:** No more than ten percent. Although in China the state is driving things, Europe has the best conditions technologically and socially.

**That sounds hopeful. Thank you both.**

## GLOSSARY

**BEV:** battery electric vehicle

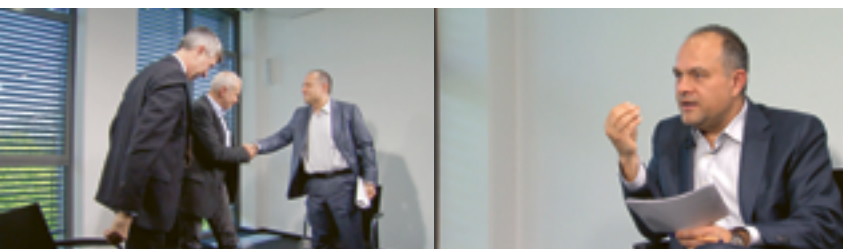
**Blue badge:** a sticker to identify particularly low-emission cars. To apply to electric cars, many diesel vehicles of the emission standard 6 (introduced in 2015), and gasoline-powered vehicles of standard 3. Diesel vehicles without the blue badge could be prohibited from driving in city centers. No date has been set for the introduction of the new standard.

**NEDC:** New European Driving Cycle. Used since the 1990s to determine exhaust gas values on a chassis dynamometer. It has been criticized for not reflecting today's driving behavior.

**PEMS:** portable emission measurement system. Records whether vehicles meet emissions standards in on-road driving.

**RDE test:** real driving emissions test. A method for testing emissions prior to type approval by taking measurements directly from the exhaust pipe under actual driving conditions.

**WLTP:** Worldwide Harmonized Light Vehicles Test Procedure. Set to be progressively introduced from 2017 as a new standard to replace the NEDC.



**Dr. Elmer Lenzen,** 48, journalist since 1998. He founded the media group macondo, which also owns the online news service UmweltDialog. His areas of focus are development policy and sustainability.