



Green mobility: EWE's CEO Werner Brinker and his E3 electric car.

## The Electric Car: Key to a Smarter World

German utility EWE has a long-standing involvement in R&D of electric cars, culminating in the E3 model developed and presented last year. Electric cars are a perfect match for smart energy systems. But the challenge is not just a technical one – the entire model of personal mobility must be reconceptualized.

By Rolf de Vos

Driving the E3 car through the green region around the picturesque city of Oldenburg, Lower Saxony, Germany, one gets a sense of a more peaceful future. The soft whizz of the electro-motor and the whispering of the air-conditioning can hardly compete with the birds' singing outside. One can clearly hear the hundreds of cars on the motorways nearby.

Inside the car, more prosaic thoughts are exchanged. EWE's CEO Werner Brinker, the civil engineer behind the steering wheel, loves driving the silent E3 car. But he acknowledges that his product is not the silver bullet that can put an end to traditional individual transport. Neither is any other present electric car: "This is an R&D project, not a wholesale project. We could manufacture some thousands, maybe some hundreds of thousands of electric cars. But mass production of millions of cars will be limited by the material requirements for batteries."

The "learning project" is the result of a unique cooperation between energy supplier EWE and car designer Karmann. In 2009, a milestone was reached with the presentation of the E3 concept. One might ask why Brinker's company – one of the larger energy suppliers and grid companies in Germany, serving 1.3 million customers – entered the field of electric cars in the first place. But during a two-hour conversation with *Living Energy*, Brinker convincingly explains EWE's interests.

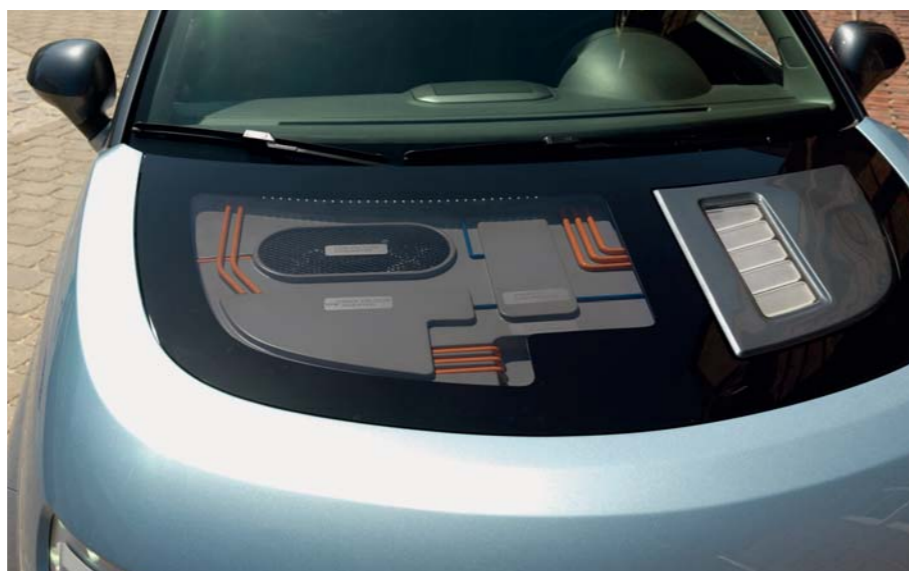
### Greater Goals

Financial considerations are secondary: It's not the extra sales that are the most interesting part for his company. "In terms of volume, electromobility would only be a minor part of electricity sales. Twenty million German cars would require only 7 to 8 percent of our total demand in Germany. So that is not our main driver."

Photo: Axel Martens / Agentur Focus

EWE and its CEO have greater goals. Significantly, the three main business parts of EWE are energy, telecom, and IT. Fourteen years ago, when Brinker returned to EWE (he became CEO two years later), EWE chose a consistent track of developing new, smarter systems. First, EWE TEL (a subsidiary in the telecommunications industry) was established; in 2000, EWE acquired an IT company. The three business fields now point into a single direction. "Climate change demands an 80 percent reduction of greenhouse gas emissions by 2050, so we have to stop burning carbon. The biggest challenge for us is transforming the energy system as a whole."

"Some years ago, we teamed up with Siemens," Brinker says. "Recently, new developments have reinforced our cooperation concerning the design of smart systems and corresponding grids and appliances." "Smart" is the key term in Brinker's expectations about future power systems. "In the old days, the design of the system was only a matter of following the physics. But we are now experiencing different arrangements of load curves and demand



The E3's batteries provide a capacity of 31.7 kWh at 288 V. The electric motor supplies 58 kW of power in sport mode or 37 kW in normal mode.

curves. We can already predict the input of wind energy two days ahead, but we'll have big power plants, biomass cogeneration, volatile wind, and highly volatile solar. Volatility of the power fed into the grid will definitely increase." At the other end of the chain, the demand profiles will change grid man-

agement. "Just imagine: At 5:15 pm, everyone will plug in their electric cars at home. That will create a huge peak. But computers and other sensitive devices are also connected to the low-voltage grid. We want to maintain a perfect stability of the system, at all times. EWE has a name to preserve in this respect, because the average outage for our customers is only four minutes a year, compared to 20 minutes for the whole of Germany, and 350 hours a year in the USA."

### Transformation

Transforming car fleets is part of this bigger plan. Brinker expects that the electric car will be a key for developing new smart systems. Moreover, cars need to become cleaner. "Cars are not covered within the European systems for emissions trading. The only possible way to achieve the climate goals in transport is to have cars running on electricity generated by renewable sources."

This is why, in the first months of 2009, he started the remarkable cooperation with Karmann. "Linking to Karmann was a natural thing for us," says Brinker. "They are engaged, they are renowned, they designed the entire BMW X1, they have a terrific develop-

ment organization – and they are located in Osnabrück, Lower Saxony, only 90 kilometers away from here." Within seven months, the new E3 electric car had been designed by EWE and Karmann: a medium-sized car with a top speed of 140 km/h and a range of 170 kilometers. Seven months from the initial contract to completion of a tangible and drivable product; it must have been a world record. Brinker puts this into perspective: "It's not a pilot car. Thirty years ago, the first electric cars were very conventional: The standard engine was replaced by an electromotor and some batteries. Our car uses new technologies, but they are all well-known. The largest challenge was assembling the different elements in a smart way." The Nickel-Cobalt Li-ion batteries consist of 160 units, providing a capacity of 31.7 kWh at 288 V. In the sport mode, the electric motor supplies 58 kW of power (37 kW in the normal mode).

### Customers

In developing new energy systems, EWE needs the effort of all stakeholders: shareholders, employees, and customers. Brinker says all stakeholders are on his side: "When EWE started building its company around these ideas, I still knew all employees. The company has grown, but everybody is still well aware of the direction. Our shareholders – mostly municipalities – support our ideas. And clients also know we are acting in their interest. They want indigenous energy sources, and to avoid being too dependent on natural gas from other countries. We are already receiving calls asking where the E3 car can be bought." As an energy supplier, Brinker sees an interesting role for the consumers in changing the systems. Instead of just selling gas and power, EWE is linking more and more to its customers, providing "energy services." "We are building new business models here. Instead of just sending an invoice once a year, we will have more regular contact. It makes no sense to turn wind turbines out of the wind when supply

exceeds demand. That's where the customers, with all their specific needs, come in."

Switching appliances (fridges, freezers, charging car batteries) on and off, changing from analog metering to digital metering, and provision of more information to the customers; these are all possible elements in a new system. Will the EWE customers like the idea of their energy supplier virtually entering their homes? Brinker sees no problem. "We already know a lot about our customers: 95 percent of all households have a washing machine, 85 percent own a dishwasher. On the other hand, we still know a lot less about people than Google or Microsoft do. We already have a lot of experience with leasing of heating systems. Why not apply this business model to refrigerators, heat pumps, and other appliances?"

This new relationship gives way to new electronic control mechanisms. Brinker gives a practical example from EWE's everyday services: "Large freezers in the food industries have to be operated at temperatures between -18 and -24° C. At peak levels, they can afford to use no power and warm up to -18°, and then cool their appliances back to -24° again in times of low power demand."

This is one way to level out peaks in demand – which are quite costly. The electric car adds an essential element to this control. For now, Brinker expects that leasing electric cars will produce the best results: "We need new personal mobility concepts. Leasing electric cars or batteries is not such a big step. Thirty years ago, every German owned his own car. Now everybody is leasing, so it's not personal anymore. We could offer different types of cars for different purposes: small cars for commuting, big SUVs for family holidays. They lease the cars and the batteries, we provide the flexibility and the guarantee that these batteries are kept in shape. Car fleet owners and well-off people are the most interesting clients in the short term."

## Biography

**Werner Brinker** (1952) is a civil engineer by training. He started working for EWE in 1978. After three years of working with PreussenElektra, he returned to EWE in 1996, advancing to become the chief executive officer two years later.

During the past decade, he has also served in several other functions, including the presidency of the German electricity association (VDEW, now BDEW). He is the honorary chairman of the Oldenburg University council. Brinker won the "Energy Manager in Germany 2006" award, and is engaged in several social projects in the region.

"A mental change is needed," Brinker concludes. "We have to offer our customers different tariffs in different periods, while providing them with data that is accurate and easy to understand. In smart energy systems, customers will become energy specialists. A pilot project with 400 regular households has already proven that it really works this way. And within this setting, the electric car is the key to a smarter world."

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### Further Information

[www.ewe.com](http://www.ewe.com)  
[www.siemens.com/energy/emobility](http://www.siemens.com/energy/emobility)

## Electric Cars in a Global Perspective

At present, only a few thousand of the overall 50 million cars produced every year are completely electric. But all large car manufacturers are now working on their electric portfolio. A leading manager of an international car manufacturer recently predicted that by 2020, 10 percent of the world's vehicle fleet will be fully electric.

Electromobility isn't limited to electric cars, but necessarily includes future-oriented, efficient and decentralized energy infrastructures. As the world's leading provider of complete solutions along the entire energy conversion chain, Siemens offers optimal answers to the changing needs of the customers, says Richard Hausmann, CEO of Company Project Smart Grid Applications including Electromobility at Siemens.

The company regards the electric car as a potential "game changer." Several different business units are working on electric car technology, both inside and outside the car. Areas of expertise include different types of charging or battery replacement stations, linked to smart grids; hardware and software for system management (metering, payment, security, etc.); and driver applications such as navigation to the nearest charging station. Furthermore, Siemens focuses on the integration of all these infrastructure elements.