

PLATFORM FOR CHARGING STATIONS

eCharge Hardy Barth's innovative charging stations offer comprehensive security through managed end-to-end encryption, real-time user authentication, secure e-payment and short charging times. Numerous complementary applications that make e-charging services even more attractive are part of the solution. Software and hardware components for authentication, charging initiation and secure contactless transaction is provided by Legic.

CHARGING STATION WITH THE SERVICE OF A GAS STATION

eCharge Hardy Barth and Legic
Introduce Charging Stations With
Complementary Customer Loyalty Services

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Emission-free driving is the EU-wide requirement from 2035. Electric vehicle charging infrastructure is transforming to accommodate the expansion of e-mobility across Europe.

The State of Electromobility in Europe

From 2035, the EU intends to permit only zero-emission vehicles. Mandatory deployment targets for EV charging and infrastructure is currently being finalized by the European Alternative Fuels Infrastructure Regulation (AFIR). The share of electric cars and cars with hybrid drives is therefore increasing every year.

Incentives Through Politics

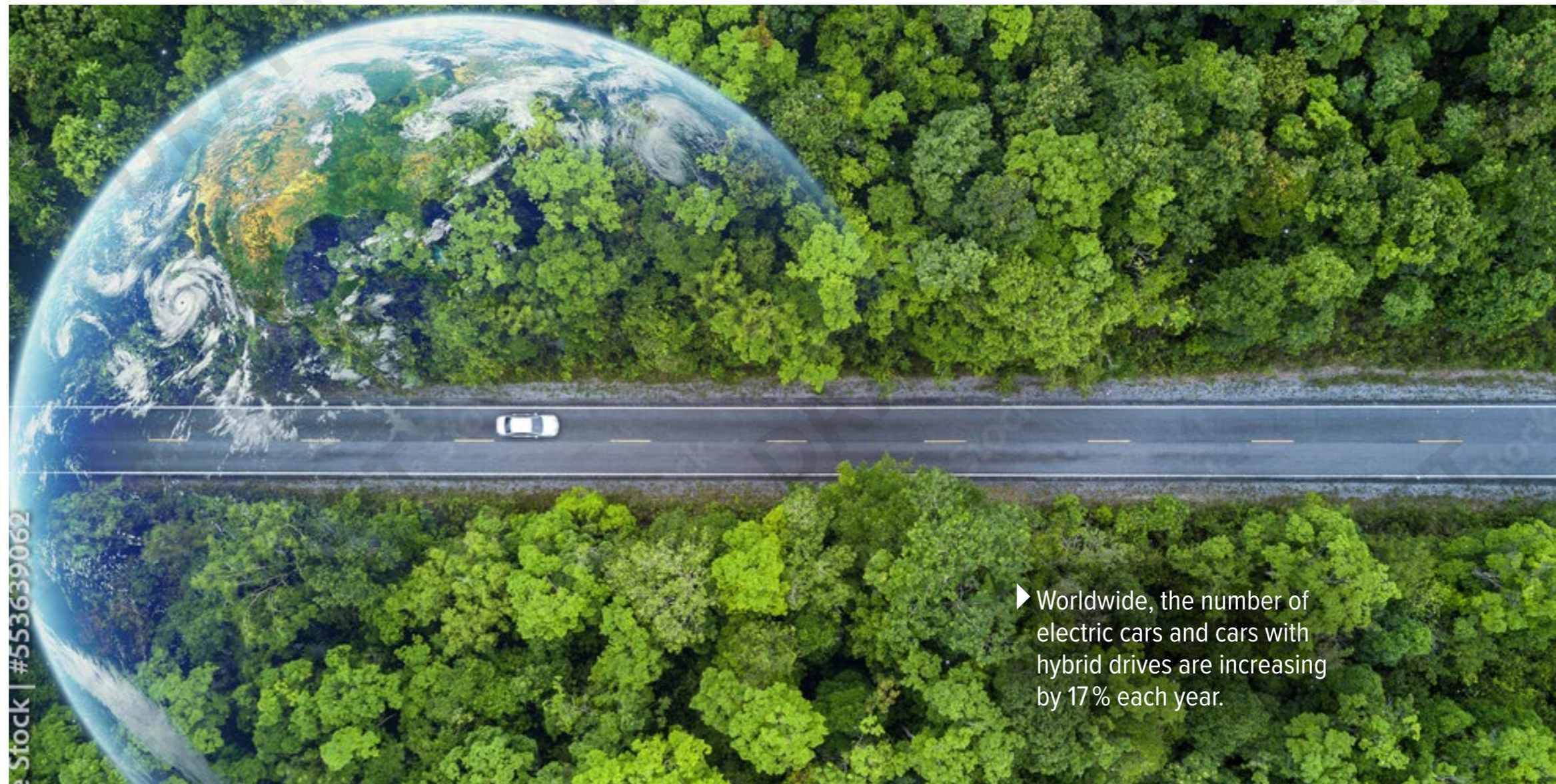
In order to support the rapid spread of electric vehicles, subsidy programs have been set up. In Germany, for example, an "Environmental Bonus" has been introduced which enormously reduces the price of fully electric vehicles as well as plug-in hybrids. Half of this "Environmental Bonus" is financed by the car manufacturer and the other half by public grants.

Which Factors are Important for E-Drivers?

According to Smithers, six main factors are driving the adoption of electric vehicles: increasing urbanization resulting in shorter driving distances, increased regulation on pollution, widening choice of electric vehicles, improvement in battery technology, perception of electric vehicles as being "cool", and the growing prevalence of charging stations.

The Expansion of Charging Stations

With gradual network expansion, a large majority of potential and current e-drivers trust in the eventual availability of a ubiquitous e-charging network grid. Decreasing charging times, increasing battery life, and the availabil-



▶ Worldwide, the number of electric cars and cars with hybrid drives are increasing by 17% each year.

ity of complementary services at charging stations via a single smartphone app are also enhancing the attractiveness of electric cars. Another important aspect is the user-friendliness of charging stations which are an integral part of the driving experience.

The Future of Charging Stations

As the network expands, charging stations in the future will become more than just a place where

the car battery is charged. Similar to a gas station, where snacks and drinks are also offered, the charging station should be able to fulfill complementary customer requirements.

Overcoming Challenges

Challenges that makers of eCharging stations face include interoperability with smartcards as well as smartphone apps, reliable, real-time

management and authentication of users and maintenance staff, seamless integration of peripheral as well as bundled services, and protection of customer and payment data over multiple fixed-line and air interfaces from user to station to cloud. To solve these issues eCharge Hardy Barth based their newest line of charging stations on the Legic Security Platform.

With additional customer loyalty services via app or smartcard, eCharge Hardy Barth supports the growing ecosystem around charging stations.

► Entrepreneur Hardy Barth is a pioneer in the development of charging stations.



Hardy Barth, Entrepreneur Since 1997

Conserving resources and driving environmental protection forward with renewable energies – these two things were already of great importance to Hardy Barth, a master electronics and network specialist, during his apprenticeship. In 1997, he founded the company "EDV- und Elektrotechnik Hardy Barth". The company focuses on the construction and distribution of PV systems. In 2007 Hardy Barth founded "ePlanung Hardy Barth" and in 2012 "eCharge Hardy Barth". The headquarters of the Hardy Barth Group is located in Birgland-Schwend, Bavaria. With a new production hall planned and built as a CO₂-neutral building in 2021, Hardy Barth is a driver of sustainability for innovations beyond the Amberg-Sulzbach region.

eCharge Hardy Barth

The production of charging stations for electric vehicles takes place in this plant. Charging stations and wallbox chargers for semi-public and public spaces as well as for private users are manufactured for charging one to four vehicles. Development, manufacturing and functional tests take place on-site. In-house development has en-

ECHARGE HARDY BARTH

abled communication to multiple PV systems, as well as load management technology. Authentication at the charging stations is done via smartcard over RFID Mifare Desfire, Legic Prime & Advant, or NFC/Bluetooth via smartphone app. The charging authorization is done via a web interface or optionally in a cloud backend.

Expanded Customer Offerings at Charging Stations

To pave the way for the e-car market, charging stations from eCharge Hardy Barth will not only support customer authentication, secure ePayment and bidirectional communication with the service provider's cloud. Complementary customer loyalty services such as discounts for e-parking, mobility services, public transport, car washing, food and beverages will also be part of the offer, via the same smartcard or mobile app.

Handling of the Charging Process

Customers can access the charging station via a mobile app or a smartcard. Interaction with the charging station is contactless via RFID, NFC or Bluetooth between the app or smartcard and the security module LEGIC SM-6310 integrated in each station. The charging process is based entirely on software and hardware from Legic, in combination with Legic-based RFID readers from Hardy Barth.

► During the charging process, customers can view and book associated offers.



END-TO-END SECURITY

Legic: Swiss Quality and Security

Legic Identsystems is an internationally active Swiss provider of hardware, software and trusted services in the field of contactless access solutions. Legic provides end-to-end security encrypted with AES for smartphone and smartcard-based access products. The product portfolio also includes platform solutions for smart city, shared infrastructure and industrial IoT applications.

Security Platform and Legic Connect

For mobile app based access to charging stations, Legic Connect provides comprehensive security through managed end-to-end encryption, real-time user authentication, secure e-payment, station status monitoring, and support for numerous complementary as well as bundled/discounted services that make e-charging services even more attractive. Legic Connect is a cloud-based Software as a Service (SaaS) that enables instant, secure distribution of credentials or other sensitive data to authorized smartphones. It is a security solution for any mobile service that meets current and future security requirements.

Legic Connect comprises three main components: A Trusted Service hosted on AWS, that fulfills the OWASP ASVS 3.0 Level 2 Security Standard (ASVS), a Mobile SDK, and Legic Security Modules that include an ARM processor, an RF transceiver (Bluetooth, NFC or RFID), and tamper-proof Secure Element (Legic SM-6300/6310). Encryption keys can be securely deployed and remotely managed at each charging station. By integrating Legic Connect into existing infrastructures, a smartphone can become anything: a door opener,



▶ With Legic Connect, charging, payment and other services are accessed via smartphone.



LEGIC CONNECT

- Cloud-based mobile credential service with end-to-end encryption
- Fully integrated in the Legic Security Platform
- Fully compatible with Legic Orbit and Legic Security Modules
- Supports Bluetooth, and NFC-HCE, online or offline
- Over 14 million end-users in over 200 countries
- Users: large companies, international hotel chains, large campuses, governments, system integrators

a train ticket, a time recording system – or a control panel for a charging station. For details, visit www.legic.com/connect

Advantages of the Solution

Thanks to the cooperation with Legic, Hardy Barth's charging stations are highly secure. Authentication of customers and maintenance personnel both online and offline takes place in real time. Optionally, customers can set up two-factor – as well as biometric authentication via a mobile app. The status of the charging process can be tracked remotely using a

Access to the charging stations – and more – is granted via the Legic Security Platform which supports smartcards via (Legic MTSC) and mobile app access (via Legic Connect).



▶ In public spaces, Hardy Barth's wallbox charger achieves its full functionality with Legic's end-to-end Security Platform.

smartphone. Multiple customer engagement services can be set up simultaneously and easily to create an attractive service ecosystem around each e-charging station. Both open and closed loop contactless payment options are supported.

Smartcard Access with MTSC

A special feature in the use of smartcards for access is Legic's highly secure smartcard platform MTSC (Master-Token System-Control). MTSC enables in-house control over access authorizations based on a smartcard-based "Master Token". Changes in the authoriza-

tions of the entire smartcard population are made via the master token. The advantage of MTSC is fast authentication without passwords. The possession of a unique, invisible and non-copyable physical medium also enables complete in-house security ownership with no dependence on outside parties. All customer interaction can be done via RFID, NFC or Bluetooth between mobile app or smartcard and a Legic Security Module is embedded in each charging station. For details, visit www.legic.com/mtsc