

## Joint Press Release

### **Pioneering cooperation: BMW Group and E.ON create 'Connected Home Charging', the first pan-European ecosystem for intelligent charging at home**

- Multi-stage Europe-wide cooperation for intelligent at-home charging
- Initial customer offering in second half of 2023
- Results from bidirectional charging pilot project will be incorporated into development of customer offering

The BMW Group and E.ON have agreed on the first pan-European cooperation for intelligent charging at home. The aim of the strategic cooperation is to create 'Connected Home Charging', a holistic charging ecosystem that will allow customers to connect their electrified BMW or MINI vehicle with the energy system, as part of a climate-neutral, sustainable household. With this unique cross-sector cooperation, the BMW Group and E.ON are laying the groundwork for harnessing the tremendous potential of electric vehicles for the transformation towards exclusive use of green energy.

Frank Weber, member of the Board of Management of BMW AG, responsible for Development, says: "BMW represents the 'Ultimate Electric Driving Machine'. But for us, e-mobility is much more than electric driving: green energy, sustainably-sourced raw materials, charging, recycling – we are driving all these key factors forward at the same time. Together with E.ON, we will make the car an intelligent element of the smart home. This will bring more balance to the private energy ecosystem, with lower costs and an improved carbon footprint, and will enable smart integration into the energy market in the future."

Patrick Lammers, member of the Board of Management of E.ON SE, responsible for the customer solutions business, adds: "E.ON and the BMW Group are already leaders in their industries. We are now leveraging our strengths and combining them to create a unique ecosystem for charging at home. In this way, we will jointly set the standard for electrified vehicles to become part of the energy market in the future and support the energy transition."

#### **Cooperation partners contribute their expertise**

The cooperation will focus on at-home charging, which is already, and will continue to be, the most important use case for charging electrified vehicles. Longer downtimes also mean that at-home charging processes are particularly well suited for intelligent control. The comprehensive ecosystem that E.ON and the BMW Group are building together is being tailored to take at-home charging

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to a new level. The core element of the ecosystem is the creation of a common interface that combines three complex and previously separate systems: BMW Group electric vehicles, customers' smart homes and the energy market.

Together, the two partners will span the entire breadth of the ecosystem, each contributing their respective competencies: As part of the cooperation, the BMW Group will be responsible for the vehicles and charging hardware and will manage the interface with the customer with a focus on their mobility needs. In addition to providing installation, electrical and connectivity services at customers' homes, E.ON will also be responsible for ensuring sustainable energy tariffs and access to the energy market, which plays a key role in the intelligent control of charging processes.

Combining the broad expertise of both partners ensures that the vehicle will fit seamlessly into the infrastructure of the user's household and the charging process will run smoothly. At the same time, it allows the benefits of in-house energy generation – for example, through a solar system – and the dynamism of the energy market to be used to benefit the customer.

### **Customer offering will be consistently developed and expanded**

The first customer offering of 'Connected Home Charging' will be available in several European countries from the mid-second half of 2023 and will lay the foundations for hardware and networking as a holistic package solution. Intelligent control of charging processes will initially enable two variants: solar-optimised charging, which allows the largest possible amount of electricity from the home's own photovoltaic system to be used, and load-optimised charging, which optimally balances the amount of electricity available at home. In addition to greater convenience, development and use of the ecosystem also offers customers the potential to save costs, increase household self-sufficiency and optimise their carbon footprint.

In the coming years, the ecosystem will be consistently expanded to include additional customer benefits: In a second step, this will include cost-optimised charging, which will extend the connectivity of fully-electric vehicles and smart homes to the energy system. Customers can then take advantage of price developments on the power exchange market with a special electricity contract that allows them to charge at low prices whenever possible. This maximises cost efficiency for charging the vehicle. At the same time, the customer's mobility needs always come first – optimal time slots are also determined based on the customer's planned departure time and required range. This option will be available to customers over the next year.

The cooperation will also create the necessary conditions for enabling bidirectional charging in the future. This technology makes it possible to use the fully-electric vehicle's high-voltage battery as an energy storage device and feed

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the stored electricity back into the customer's own household or the power grid at a later time.

### **Results from BDL pilot project used in developing customer offering**

The results of the joint research project 'Bidirectional Charging Management – BDL', which was successfully completed at the end of 2022, are being incorporated into development of the future customer offering. The focus was on using a holistic approach for the first time to connect vehicles, charging infrastructure and power grids in a way that promotes renewable energy and increases security of supply. For this purpose, 50 regenerative BMW i3s were provided to customers.

The results of the research project, which was conducted by the BMW Group and E.ON subsidiaries Bayernwerk and E.ON Energie Deutschland, together with various other players from the automotive industry, charging infrastructure, energy industry and academia, have been consistently positive at all levels. From the customer perspective, the entire system was easy to integrate into everyday life and was found to be useful and worthwhile. This is also reflected in their high willingness to continue using BDL technology.

With regard to the 'vehicle to grid' application, i.e., feeding energy into the power grid, the effectiveness of bidirectional charging management was demonstrated: On the one hand, intelligently controlled integration of electric vehicles into the power grid can further increase renewable energy as a share of total consumption in Germany. On the other, electric vehicle storage systems can absorb peaks in production from wind and solar plants in a targeted manner and release them again in times of low generation, while continuing to meet customers' driving needs. This can reduce the need to fire up fossil-fuel power plants and their emissions at such times. In addition, bidirectional charging technology can thus contribute to supply security and grid stability.

In this way, electromobility is increasingly becoming an integral part of the energy transition: Its ramp-up reduces CO<sub>2</sub> emissions both from mobility and electricity generation. Scaled for electric vehicle fleets from 2030, bidirectional charging could even have positive economic effects, since using the batteries of millions of electric vehicles could reduce the need to build up large-scale battery storage systems and gas power plants.

### **Smart charging has huge potential**

From the BMW Group and E.ON perspective, the project results underline the tremendous potential of bidirectional charging and demonstrate the central role that technology will play in holistic energy management in the future. Cost advantages can already be achieved with standard unidirectional charging, by taking advantage of cost-optimised time slots and relying on solar power from the household's own photovoltaic system – preferably using renewable energy. This

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is the aim of the solar-optimised and load-optimised charging options that will be available in several European countries from the middle of the second half of the year.

Bidirectional charging technology will enable further functionality and optimisations in the ecosystem, such as allowing the electric vehicle to provide grid-supporting and stabilising services as part of bidirectional charging or the more comprehensive, optimised use of green energy through the entire power grid.

Against this background, both partners will focus their efforts on the opportunities offered by bidirectional charging and its two central use cases: 'vehicle to home' (feeding electricity from the high-voltage battery into the household) and 'vehicle to grid' (feeding electricity from the high-voltage battery into the power grid) – with the clear aim of creating appropriate customer offerings in the medium term.

#### **Successful cooperation expanded and intensified**

This cooperation on intelligent at-home charging expands the successful cooperation between E.ON and the BMW Group. The BMW Group operates one of Germany's largest company charging networks, which E.ON has built up since 2019. It now comprises more than 5,500 charging points at eight German locations. More than 1,600 of these are eRoaming-capable and therefore publicly accessible. Expansion will continue in 2023 and 2024: BMW branches in Germany will also be connected to the company charging network, which will then include more than 6,000 charging points. All charging points are powered entirely by renewable energies.