



## **BMW ActiveE Electric Vehicle**

**The second phase of BMW Group's electro-mobility development is ready to take to the road**

**Woodcliff Lake, NJ – February 10, 2011...** The introduction of the BMW ActiveE marks the launch of the second phase of the BMW Group's electro-mobility development strategy. Like the MINI E before it, the BMW ActiveE will be available for lease in select markets beginning in Fall 2011.

### **project i - research and development of tomorrow's mobility.**

The BMW ActiveE is the BMW Group's next step towards an emission-free, mass-produced electric vehicle. Within the framework of project i, the BMW Group is carrying out research and development work on the development of electrically powered vehicles. The ultimate goal is the concept of a Megacity Vehicle (MCV) that meets the demands of a sustainable mobility solution for congested urban areas. For this reason, the drive components and battery technology that will be used in the MCV are being tested in the BMW ActiveE.

Ongoing field tests involving more than 600 MINI E cars, including 450 in the US, have already provided vital knowledge about the demands on future electrically powered production vehicles. Beginning in 2011 in the US, Europe and China, a test fleet of over 1,000 BMW ActiveE vehicles, produced at BMW's Leipzig plant, will provide further valuable insights into the everyday use of the vehicle. The findings will serve to deepen the knowledge already gained on the everyday use of electric vehicles and to learn more about customer requirements. The feedback from customers testing the MINI E and the BMW ActiveE will be fed directly into series production of the MCV, which the BMW Group will be launching under a new sub-brand in 2013.

With the BMW ActiveE, the BMW Group is extending field tests on electric mobility and is intensifying research into electric mobility in everyday driving. For this reason, the drive components and battery technology that will be used in the MCV are being tested on the BMW ActiveE. The knowledge gained will be fed directly into series development of the MCV. With the BMW ActiveE, the future of individual mobility combining driving pleasure with zero tailpipe emissions is one step closer.



**Electric mobility as a supporting pillar of the EfficientDynamics development strategy.**

In the development of groundbreaking vehicle concepts and drive technologies within the framework of the EfficientDynamics strategy, the BMW Group attaches key importance to electric mobility. With EfficientDynamics the BMW Group has for been very successful in reducing fuel consumption and emission levels through new and highly-efficient engine generations, enhancement of aerodynamics, the use of innovative lightweight construction and intelligent engine management - all with better performance in the bargain. Thanks to EfficientDynamics, the company is now able to achieve additional economy advantages through the further electrification of the drive train and hybrid technology. In the medium term, the BMW Group is developing vehicle concepts for emission-free mobility in larger urban areas. In the long term, EfficientDynamics means the transition to emission-free mobility - using both battery power and sustainably produced hydrogen.

On the way to sustainable, CO<sub>2</sub>-free mobility, the BMW ActiveE represents the next major milestone. Following the MINI E, the BMW ActiveE is the BMW Group's second electric vehicle made available to consumers. With output of 170 horsepower and maximum torque of 184 lb-ft, the car accelerates from 0 to 60 mph in under nine seconds (preliminary), demonstrating the dynamic characteristics typical of a BMW. At the same time, newly developed lithium-ion batteries facilitate a vehicle range of around 100 miles in everyday driving.

Just like the MINI E, the BMW ActiveE is a conversion car, an electric vehicle based on the body and chassis of an existing car. The BMW ActiveE integrates all-electric drive components such as batteries, electric motor and power electronics in a vehicle body that was not originally intended for this purpose - and without significant compromise on space or interior comfort. Therefore, the BMW ActiveE is the BMW Group's first electric vehicle to offer four fully-fledged seats and a seven cu-ft luggage compartment. The BMW ActiveE incorporates a pilot series version of the same drive train and batteries planned for the MCV.

**The design: clearly a BMW, clearly a very special concept.**

The BMW ActiveE is based on the BMW 1 Series Coupe. The convex-concave design vocabulary gives the vehicle an even more dynamic appearance. However, specific visual interior and exterior accents highlight the exceptional character of the purely electrically powered BMW. Silver colored, circuit-inspired graphic elements on an Electric Blue background run over the entire Alpine White body. The intentional asymmetry of the graphic elements gives the vehicle a distinctive appearance. The blue shadowing provides additional depth.



The exterior design of the BMW ActiveE is further differentiated by the power dome in the hood which provides space for the batteries located under it. The completely closed rear apron is a distinctive feature of the BMW ActiveE. Since the ActiveE does not have an engine, there is no need for tailpipes and an exhaust system. Where the tailpipes are normally located, the

BMW ActiveE boasts a silver-blue accentuating trim in the completely closed rear apron that indicates that the vehicle is free of emissions. Other distinguishing features include the “ActiveE” logo on the back of the car and the “eDrive” logos on the fenders.

In order to increase the vehicle’s range even further, the BMW ActiveE rides on the latest generation of tires with optimized rolling resistance. The result is a rolling resistance that is up to twenty percent lower compared to previous series production tires. The wheels of the BMW ActiveE are complemented with BMW’s lightest 16-inch alloys and boast a double V-spoke design.

In the interior the features of a BMW 1 Series Coupe are combined with individual details that emphasize the unique nature of the BMW ActiveE. Blue contrasting seams accentuate the Dakota Leather seats in exclusive Pearl Grey. Dashboard and door linings are fitted with Alpine White interior trim, which is available for the first time, and sport an “ActiveE” appliqué that transfers the exterior graphics into the interior of the car. The shift lever plaque in black and blue complements the overall graphic concept.

### **BMW eDrive - the BMW ActiveE’s control display concept.**

The instrument cluster and the control system were specifically adapted to the electric drive concept of the BMW ActiveE. In place of a tachometer, the instrument on the right of the cluster shows the amount of energy being taken from the battery or the current amount being supplied to it through recuperation. When the vehicle is at a standstill, the needle in the middle position indicates that the vehicle is ready to drive, as the BMW ActiveE has no engine sound to inform the driver whether or not it is ready to drive. If the vehicle is not ready, the needle rests at the bottom left of the instrument. The “fuel gauge” below it indicates the battery charge level. Furthermore, the onboard computer provides additional vital information such as the remaining vehicle range, for example.

The eDrive display functions on the Central Information Display depict vehicle energy flow. During the journey an active schematic representation of the vehicle informs the driver whether



energy is currently being taken from the battery or being fed into it through recuperation. Moreover, the driver can see the current charge state of the battery and also check whether the air conditioning or the heating system is currently in use. This representation can, if required, also be shown as a split screen to allow the simultaneous display of additional infotainment contents or the route guidance of the navigation system. When the vehicle is at a standstill, it is also possible to see on the display whether the vehicle is currently being charged or whether the battery and interior are being climatically conditioned. In addition, a special battery information menu provides information on the battery energy level, as well as the current and remaining vehicle range. During charging it also indicates the remaining charging time.

### **Optimum comfort, optimum efficiency - the ECO PRO Mode.**

If the driver wishes to increase the range of the BMW ActiveE even further, it is now possible to do this via the ECO PRO Mode. As soon as the driver activates the switch on the center console, the vehicle's drive configuration and comfort functions are modified to facilitate an even more efficient driving style. The accelerator pedal mapping program delivers less power in the ECO PRO Mode than in the normal driving mode, but with the same pedal travel. The heating and air conditioning systems have a flatter setting and therefore use less energy. The driver is also provided with tips on how to reduce energy consumption even further for the best possible driving efficiency.

### **Emission-free, powerful and compact: the drive system of the BMW ActiveE.**

The BMW ActiveE represents typical BMW driving pleasure in a new, emission-free form. The heart of the BMW ActiveE is the powerful electric synchronous motor. Maximum power output of the electric drive system is 170 horsepower while maximum torque of 184 lb-ft is available from a standstill, as is typical of electric vehicles, and it remains available across an exceptionally broad load range. As a result, the BMW ActiveE accelerates from 0 to 60 mph in under nine seconds. Top speed is electronically limited at around 90 mph.

The permanent-magnet synchronous motor and the power electronics of the BMW ActiveE were developed entirely in-house and are characterized in this combination by exceptional efficiency, optimized power development and a compact design. The innovative character of the electric drive system is reflected above all in the relation between engine output and space requirement. The entire power pack, including power electronics and transmission with differential, is



integrated into the modified rear-axle support of the BMW ActiveE, and with 170 horsepower, still has a total weight of only around 200 lbs.

**Brake Energy Regeneration: drive and slow down with the accelerator pedal.**

The driving experience of the BMW ActiveE is enhanced by the possibility of slowing down using the accelerator pedal via brake energy regeneration. When the driver lifts off the accelerator pedal, the electric motor becomes a generator that feeds the electricity gained from kinetic energy back into the vehicle battery. At the same time, braking torque is created, which effectively slows the vehicle down. In this way, the accelerator pedal becomes a “drive pedal.” In urban traffic around 75 percent of all deceleration can be accomplished without using the brake pedal at all. Intensive use of this recuperation of energy via the motor also results in a range increase of up to 20 percent. Only when the driver wishes to slow down faster by stepping on the brake pedal does the conventional braking system of the BMW ActiveE come into play.

**Gliding - “coasting” along the road.**

Unlike the MINI E, the BMW ActiveE features a distinctive “intermediate position” of the accelerator pedal, allowing the vehicle to “glide.” As a result, the vehicle does not immediately recuperate when the driver decelerates, but “de-clutches” using the electric motor’s zero momentum control, thereby utilizing its own kinetic energy to move forward. The BMW ActiveE then “glides” along the road without using energy. Gliding offers a most convenient way of increasing the vehicle’s range.

**Intelligent vehicle dynamics through Stability Management for Regeneration.**

When the driver lets off the accelerator pedal to slow down, the regenerative brake torque only works on the rear wheels. Therefore the BMW ActiveE features an adapted drive-active vehicle dynamics interface, “Stability Management for Regeneration,” in order to also ensure vehicle stability during recuperation. The Dynamic Stability Control system has been adapted to the specific characteristics of the electric drive train. Based on various parameters, Stability Management for Regeneration adapts the recuperation level to each driving situation, combining the highest level of recuperation with best possible vehicle stability when decelerating in any situation. Should a situation arise that is critical for vehicle stability when using recuperative or hydraulic brakes, the optimized DSC function ensures constant vehicle stability by means of targeted intervention into the braking system and engine management. Furthermore, DCS ensures



that the rear wheels are able to convert the high torque of the electric drive into maximum propulsion when starting off.

### **Lithium-ion batteries with liquid cooling system.**

Specially developed lithium-ion storage cells ensure the energy supply of the drive system and all further functions of the BMW ActiveE. These high-voltage battery units are exceptional for their high storage capacity. The BMW ActiveE features large-format storage cells, which are being used for the first time and were jointly developed by the BMW Group and its associate partner SB LiMotive exclusively for automotive use.

With the BMW ActiveE developers are testing the storage cells and the storage electronics, which are to be installed later in the MCV. Combined into modules of six, eight or ten storage cells, they fit perfectly into the available space in the BMW ActiveE. The large battery unit of the BMW ActiveE takes up the space in the lower area of the vehicle normally intended for the drivetrain in a conventional vehicle. In order to accommodate additional storage cells, the space at the rear that has become available through the omission of a fuel tank is also utilized. Further lithium-ion cells are located at the front end in front of the cowl.

The BMW ActiveE's three large storage modules are each protected by a specially-constructed steel-plate battery housing with integrated liquid cooling system. The cooling system constantly maintains the ideal operating temperature of the batteries, thereby contributing to an increase in the service capability and lifespan of the battery cells. The air conditioning/heating system tempers the liquid running through the storage unit housing via a heat exchanger. When connected to the electrical grid, the liquid can also be heated in order to bring the energy storage units up to the ideal temperature of approximately 70° Fahrenheit.

Thanks to these measures, the BMW ActiveE achieves a range of approximately 100 miles with a full battery charge. Intelligent battery management especially developed for the BMW ActiveE ensures that this range can be achieved as far as possible independent of external climatic conditions.

### **Fast and flexible recharging.**

The development of electrically driven series production vehicles also encompasses innovative solutions for flexible, convenient and user-friendly charging of the vehicle's batteries. The lithium-ion battery units featured in the BMW ActiveE can be recharged from multiple external power sources. In addition to using the wallbox, a 32-ampere charging dock installed at the



user's home, the driver can also connect the vehicle to a conventional power socket or a publicly accessible charging station. The standardized SAE J1772 charging port on the vehicle ensures compatibility with most charging stations.

The battery can be fully charged within four to five hours using the wallbox at 32 amperes. A range of around 25 miles is possible after just a one-hour charge at the wallbox.

### **The power electronics - greater efficiency, enhanced development of power.**

The BMW ActiveE's power electronics developed by BMW have been designed to get the maximum potential out of the electric motor. As in the future MCV, the BMW ActiveE's power electronics are located above the rear axle on the electric motor, forming a complete unit together with the motor.

Apart from controlling the electric motor, the power electronics also ensure the power supply to the onboard electrical systems. With the aid of a voltage transformer and incorporating intelligent battery management, they ensure the reliable supply of electricity to all vehicle functions, including the comfort and infotainment features. Central control functions, which are integrated into both the power electronics as well as the energy storage system, constantly monitor all components.

### **Everything from a single source - BMW Group drive technology competence.**

The performance of the drive system in the BMW ActiveE is typical of a BMW. The exceptional dynamics and efficiency are the result of intensive development efforts. With the exception of the storage cell, BMW Group engineers develop everything that constitutes an electric vehicle – the energy storage module and its wiring, the electric motor, the power electronics and the transmission. After all, the BMW Group is committed to producing the world's best drive systems - drive systems that stand out from the competition through efficiency, performance and running smoothness, even when electric power and not fuel is being transformed into movement.

### **Superior and comfortable - typical BMW, even with regard to handling.**

On the road, the BMW ActiveE offers the typical BMW driving experience, offering the handling characteristics and performance of a BMW 1 Series Coupe. The positioning of the batteries lowers the vehicle's center of gravity. Moreover, the flexible distribution of the storage units facilitates the 50:50 weight distribution typical of BMW automobiles.



In addition to the adaptation of the rear axle to accommodate the electric drive, the BMW ActiveE's suspension-related modifications are mainly restricted to specific components. For example, steering characteristics, springs and shock absorbers are adapted to the higher weight compared to the production version of the BMW 1 Series in order to reproduce typical BMW handling in combination with the electric drive train. The suspension setting was chosen with a special focus on comfortable and superior driving in cities and the urban environment for which the BMW ActiveE is predominantly designed.

### **BMW ConnectedDrive remote functions for the BMW ActiveE.**

With BMW MyRemote, BMW enables the user to access the extensive range of BMW ConnectedDrive functions via an app for the Apple iPhone (from 3G) and the iPad. The user has at his or her disposal all BMW ConnectedDrive remote functions using the CE device, such as locking and unlocking the doors, the activation of the horn or headlamp flasher for locating the vehicle within sighting or hearing range, the CarFinder for locating the car within a radius of up to 3,300 feet, as well as the Google Local Search function.

In addition, new remote functions developed especially for the BMW ActiveE for battery charge control and vehicle preconditioning have been incorporated into the range of functions. Via the customer's ConnectedDrive Account, the iPhone application establishes a unique connection with the vehicle and automatically displays the additional range of functions as soon as the ConnectedDrive Account has been identified. However, prerequisite for all remote functions is that both the vehicle and the user are receiving a signal. Of course, the driver has access to the BMW ConnectedDrive functions without using an iPhone. This serves solely as a remote control and information device.

### **eCommand: charge level, range and preconditioning at a glance.**

The specific electric car functions, called eCommand, comprise both charge control and control of the preconditioning of both the batteries and the interior cabin. The charge control function allows the user to start and stop the charging process, as well as the setting of a charge timer. Via charge control, the user can view the charge level at any time and see whether the vehicle is currently being charged. Users are informed of the battery charge level (State of Charge), the vehicle's current travel range with a full battery charge and the time remaining until the batteries are fully charged. Another display function informs users how far away they are from work or the destination that has been predefined as their home, so that they are able to make a best possible estimation of the distance they are still able to travel. Moreover, the app informs users



where the nearest battery charging stations are, offering the opportunity to send these directly to the navigation system's routing function as an interim destination.

### **Preconditioning for enhanced vehicle range.**

Unlike the MINI E, the BMW ActiveE offers the user the potential to cool or heat both the batteries and the car interior using intelligent preconditioning when the vehicle is connected to the grid, thus bringing them up to the ideal operating temperature even before setting off. A preconditioned vehicle offers two advantages: first, the ideal operating temperature of the batteries guarantees highest possible power output and ensures a longer range. Secondly, the interior is already adjusted to a pleasant temperature prior to starting a journey - both in the summer and the winter. Intelligent preconditioning of the BMW ActiveE automatically determines according to the ambient temperature to what extent the vehicle and the battery should be pre-cooled or heated.

Using the BMW MyRemote application, preconditioning can be activated directly or the user can determine via the timer when preconditioning should start. For instance, he or she can ensure that the vehicle is pre-cooled or heated in the mornings before they use the car. However, it is only possible to precondition the car if it is connected to a charging terminal. This ensures that the vehicle's range is not shortened by preconditioning, on the contrary, it actually increases it. Due to the heating and cooling process while the vehicle is connected to the power supply, the energy required for this is no longer drawn from the battery during the journey. Charging and preconditioning functions are, of course, also directly accessible and controllable from inside the vehicle.

### **BMW ActiveE arrives in the US this fall**

The BMW ActiveE is scheduled to make its North American debut this April at the New York International Auto Show. It will be available for lease on a limited basis beginning this fall in the metropolitan markets of Los Angeles, San Diego, San Francisco, Sacramento, New York and Boston, as well as the state of Connecticut.

### **BMW Activate the Future**

In the meantime BMW has started a broader conversation about the future of mobility that thinks "beyond the car." To start the conversation, throughout the month of February, BMW will launch a four-part online documentary series entitled "WHEREVER YOU WANT TO GO: Four Films about the Future of Mobility," which is intended to create a broader conversation about the



future of mobility and to challenge existing consumer mindsets. Go to [www.BMWActivatetheFuture.com](http://www.BMWActivatetheFuture.com) to join the conversation.

### **BMW Group In America**

BMW of North America, LLC has been present in the United States since 1975. Rolls-Royce Motor Cars NA, LLC began distributing vehicles in 2003. The BMW Group in the United States has grown to include marketing, sales, and financial service organizations for the BMW brand of motor vehicles, including motorcycles, the MINI brand, and the Rolls-Royce brand of Motor Cars; DesignworksUSA, a strategic design consultancy in California; a technology office in Silicon Valley and various other operations throughout the country. BMW Manufacturing Co., LLC in South Carolina is part of BMW Group's global manufacturing network and is the exclusive manufacturing plant for all X5 and X3 Sports Activity Vehicles and X6 Sports Activity Coupes. The BMW Group sales organization is represented in the U.S. through networks of 338 BMW passenger car and BMW Sports Activity Vehicle centers, 138 BMW motorcycle retailers, 103 MINI passenger car dealers, and 30 Rolls-Royce Motor Car dealers. BMW (US) Holding Corp., the BMW Group's sales headquarters for North America, is located in Woodcliff Lake, New Jersey.

Information about BMW Group products is available to consumers via the Internet at: [www.bmwgroupna.com](http://www.bmwgroupna.com).

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**Journalist note:** Information, images and video related to BMW and its products in the USA is available to journalists on-line at [www.bmwusanews.com](http://www.bmwusanews.com).

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