



## **The BMW ActiveHybrid 5**

### *Full Hybrid Power comes to the 5 Series Sedan*

**Woodcliff Lake, NJ – January 27, 2012** ....BMW takes the development of intelligent hybrid drive systems to the next level with the introduction of the BMW ActiveHybrid 5 – another series-produced model in which a combustion engine and electric motor join forces to enhance both efficiency and the brand’s hallmark driving pleasure. The BMW ActiveHybrid 5 brings together a BMW TwinPower Turbo in-line 6-cylinder engine, an electric drive system and an 8-speed automatic gearbox for the first time. The latest generation of BMW ActiveHybrid technology also adds precisely controlled – and therefore extremely effective – intelligent energy management. All of which gives the BMW ActiveHybrid 5 an exceptional balance of performance and fuel efficiency for the benchmark performance sedan in the premium executive car class.

Its drive system generates combined output of 335 hp, allowing the car to be driven on electric power alone up to 37 mph (60 km/h) for 2.5 miles (4km), and accelerates the BMW ActiveHybrid 5 from 0 to 60 mph in 5.7 seconds (preliminary). The BMW ActiveHybrid 5 will arrive as a 2012 model in US showrooms in March 2012 with a base MSRP of \$61,845 (including \$895 destination and handling).

The 300 hp inline-6 with BMW TwinPower Turbo technology in the BMW ActiveHybrid 5 is the same engine well-known for its free-revving capability, pulling power and efficiency in the BMW 535i. The electric motor develops 54 hp and is supplied with energy by a high-performance lithium-ion battery housed in the trunk.

A harmonious blend of power from the two drive systems ensures that the BMW ActiveHybrid 5 boasts not only the sportiest performance in its market segment but also a significant improvement in efficiency). Its full-hybrid drive system enables driving on purely electric power which means emission-free driving in urban conditions.

In order to fully exploit the potential of the BMW ActiveHybrid technology, the power electronics in the BMW ActiveHybrid 5 uses a host of technologies to ensure the drive system runs at peak efficiency. The high-performance lithium-ion battery is recharged when the car is coasting or braking. The electric motor acts as a generator feeding energy into the high-voltage battery. By contrast, under acceleration, the electric motor

takes on a boost function assisting the inline-6 by generating an extra burst of power, giving the sedan's sporty driving character a noticeably sharper edge.

Integrated into the standard Driving Dynamics Control is an ECO PRO mode. It provides a relaxed and fuel-efficient driving style by tailoring the driving systems for maximum efficiency, including making more frequent use of all-electric mode. In ECO PRO mode, the combustion engine can be switched off and fully decoupled while coasting at speeds of up to 100 mph (160 km/h). This coasting mode combines comfortable driving with optimum utilization of the kinetic energy already generated. To avoid periods with the engine running at idle – at traffic lights or in stop-and-go traffic, for example – the BMW ActiveHybrid 5 is equipped with a hybrid start-stop function. Plus, the power electronics in the BMW ActiveHybrid 5 are linked up with the standard navigation system. This allows proactive analysis of driving conditions based on the selected route. This enables the drive components to be primed to deliver maximum efficiency (the effect may vary according to the quality of the available navigation data).

All the hybrid-specific components of the drive technology and energy management systems have been developed specially for use in the BMW ActiveHybrid 5. Both the electric motor and the air conditioning compressor are powered exclusively by the lithium-ion high-voltage battery, via the high-voltage electrical system. This allows a pleasant interior climate to be maintained even when the internal combustion engine is switched off – i.e. when the car is at a standstill, operating purely on electric power or in coasting mode. All of the new hybrid components are designed with durability to last the life of the vehicle.

**Innovative combination: award-winning 6-cylinder inline engine, newly developed electric drive system.**

The BMW ActiveHybrid 5 is the first hybrid model to use a BMW inline 6-cylinder engine in its powertrain. The BMW ActiveHybrid 7 and BMW ActiveHybrid X6 both utilize a V8 engine, which is combined with either one or two electric motors. The 3.0-liter inline-6, which develops 300 hp and peak torque of 300 lb-ft, has won both the International Engine of the Year Award and the Ward's 10 Best Engines Award two years running. The BMW TwinPower Turbo technology in the inline-6 combines a twin-scroll turbocharger, High Precision Direct Injection, Double VANOS variable valve timing and VALVETRONIC

intake control. This technology package improves throttle response, revving ability, refinement and efficiency, while an aluminum crankcase also optimizes weight.

The synchronous electric motor of the BMW ActiveHybrid 5 is integrated into the housing of the 8-speed automatic transmission, saving space. The interplay between the electric motor and gearbox is controlled by a clutch. The motor's operating temperature is regulated by the combustion engine's cooling system. The electric drive system develops 54 hp and makes 155 lb-ft of torque available from start. The motor is supplied with energy by a high-performance lithium-ion battery, specially developed for the BMW ActiveHybrid 5. The high-voltage battery is encased in special high-strength housing and positioned between the wheel arches in the trunk, providing it with optimum protection. It consists of 96 cells, has its own cooling system and offers usable energy capacity of 675 Wh.

The BMW ActiveHybrid 5 has both a conventional 14-volt power supply and a high-voltage supply with an operating voltage of 317 volts. They are linked by a voltage transformer which ensures that maximum electric energy can be used to enhance driving dynamics and comfort in any operating phase. Like the electric motor, the air conditioning compressor is also fed with power from the lithium-ion battery exclusively via the high-voltage supply. This ensures a pleasant interior climate, even when the combustion engine is switched off – i.e. when the car is at a standstill, operating purely on electric power or in coasting mode. In addition, the stationary climate control function can be used to cool the interior before the engine is started.

**Electric motor: eager power delivery, compact design.**

The BMW ActiveHybrid 5's synchronous electric motor not only supports all-electric operations around town, it can also provide a performance-boost to the gas engine to deliver more powerful acceleration. In either case, the drive power is supplied instantly and without lag. Like all electric motors, it develops its full torque – of 155 lb-ft (210 Newton meters) – from a standing start.

Due to its high internal efficiency and low weight, the eight-speed automatic transmission contributes significantly to the efficiency of the powertrain. With its eight speeds, it combines a wide gear range with close ratio gear spacing. It also allows more use to be made of top gear, for a fuel-efficient, low-rpm driving style. The direct downshift capability and exceptionally short shift times can support very sporty driving. There is a controller throughout the high-performance transmission that ensures gear changes are always closely matched to the driver's demands and the driving situation.

**Intelligently controlled hybrid technology: unprecedented precision for maximum efficiency.**

To make the most of the ActiveHybrid technology in the BMW ActiveHybrid 5, the power electronics incorporate a range of innovative intelligent energy management functions whose aim is to ensure that the powertrain operates as efficiently as possible. The BMW ActiveHybrid 5 can operate in all-electric mode up to a speed of 37 mph (60 km/h), for zero emissions in town. The lithium-ion high-voltage battery can store sufficient energy to give an all-electric driving range of up to approximately 2.5 miles (4 km) at an average speed of 22 mph (35 km/h).

The internal combustion engine is only started when the driver requires more power: it is then engaged automatically. The electric motor provides a “boost” function to supplement the engine when accelerating. Maximum combined power is 335 hp with maximum torque of 330 lb-ft. Under combined internal combustion/electric power, the BMW ActiveHybrid 5 sprints from 0 to 60 mph in 5.7 seconds (preliminary).

**Hybrid-specific Auto Start-Stop function and coasting mode.**

The specially designed Hybrid Auto Start-Stop function provides seamless operation when the vehicle is stopped in traffic – after the internal combustion engine is shut off, the automatic climate control continues to run off the lithium-ion battery. When the driver releases the brake, the vehicle will restart on either the electric motor alone or the electric motor and the inline-6, depending on the high-voltage battery’s current charge level and on how much power the driver wants.

Another innovation pioneered in the BMW ActiveHybrid 5 is the coasting mode. It further improves efficiency by shutting the internal combustion engine down not only when the vehicle is stationary, or when driving in town, but also while coasting at higher speeds. This coasting mode is available at any speed up to 100 mph (160 km/h). Coasting mode switches off the internal combustion engine and disconnects it from the drive shaft. From this point on, the BMW ActiveHybrid 5 continues moving soundlessly, with zero emissions and with no engine braking effect. In coasting mode, as with all-electric mode for urban driving, all safety and comfort functions remain fully operational.

### **Intelligent energy management reads the road ahead.**

The advanced power electronics coordinate the operation of the internal combustion engine and electric motor proactively based on the selected driving route for even more efficient energy management in the BMW ActiveHybrid 5. The power electronics are integrated with the standard navigation system, which means they can access and analyze data indicating changes in certain road conditions based on the route ahead, or driver requirements. From this analysis, all powertrain systems and the on-board electronics are managed appropriately so that energy can be used as needed or stored in preparation for what is coming up in order to make the most efficient possible use of the available energy.

Factors that may cause a change in power train operating strategy include the topography of the route and speed limits. For example, if the selected route indicates that a hilly stretch is coming up soon, the BMW ActiveHybrid 5 can invest all the high-voltage battery's electrical energy in providing supplementary driving power for the up-hill without concern about depleting the battery, knowing that the battery will be recharged at "no cost" during the subsequent descent. On longer downhill sections the electric motor's generator function can be used to recharge the high-voltage battery with no loss of speed. The operating strategy can also be managed so as to ensure that the high-voltage battery is as fully charged as possible when nearing the end of the journey, thereby increasing the potential electric driving range in anticipation of lower driving speeds.

The operating status of the powertrain components is shown in displays unique to the ActiveHybrid 5, in the instrument cluster, the Control Display, as well as the energy flow and energy recuperation display. There is an additional gauge next to the tachometer which shows the boost being provided by the electric motor during acceleration. A display in the iDrive interface provides a variety of information – for example on the battery's current charge level and the power-sharing between the internal combustion engine and the electric motor during the course of a journey.

### **Design: sporty elegance with individual accents.**

The BMW ActiveHybrid 5 reflects the sporty yet elegant body design of the BMW 5 Series Sedan complemented by custom touches which highlight the identity of its drive technology. The "ActiveHybrid 5" lettering on the C-pillars, the BMW kidney grille with galvanized slats and the exhaust matte chrome tailpipes set the exterior apart from the other models in the range. Available as an option are 18-inch Streamline light-alloy wheels

displaying exceptional aerodynamic efficiency. The BMW ActiveHybrid 5 is the only model in the BMW 5 Series line-up to be available in the exterior paint shade Bluewater metallic, and it also stands out visually from all other 5 Series variants with door sill strips bearing “ActiveHybrid 5” lettering, an aluminum plate on the center console with the same ID, a custom engine cover and the visible “ActiveHybrid Power Unit” inscription on the special casing for the high-performance battery integrated in the luggage area.

**State-of-the-art hybrid technology, typical BMW 5 Series:  
highest standards of driving dynamics, safety and comfort.**

The chassis specifications of the BMW ActiveHybrid 5 are pure BMW 5 Series. They include double-wishbone front and integral rear suspensions, Servotronic speed-sensitive power steering, a high-performance brake system and 18-inch alloy wheels. Dynamic Damper Control, featuring electronically controlled shock absorbers are also available as an option. The Dynamic Stability Control system, which stabilizes the vehicle by individually applying the brakes and reducing engine power, also incorporates functions such as Dynamic Traction Control, the Anti-lock Braking System, Cornering Brake Control, Dynamic Brake Control, Brake Assist, Brake Fade Compensation, Brake Drying and Start-Off Assistant.

The hybrid-specific safety features, which protect the high-voltage lithium-ion battery and the power electronics, are integrated into the BMW 5 Series’ existing active and passive safety systems. In a collision, high-strength structural components and large deformation zones help to keep impact forces away from the passenger cell and also from the hybrid drive components. Other standard safety systems on the BMW ActiveHybrid 5 include front and side airbags, side curtain head airbags for front and rear passengers, three-point inertia-reel belts on all seats, belt force limiters and belt latch tensioners on the front seats and ISOFIX child seat attachments in the rear. BMW Assist includes enhanced Automatic Collision Notification. In the event of a collision severe enough to cause an airbag to deploy, eACN (enhanced Automatic Collision Notification) immediately calls the emergency call center from the car’s embedded phone. It not only transmits the car’s location but also an assessment of the risk of severe injury to the people inside, based on a ground-breaking injury assessment algorithm. This assessment is provided to first responders before they even arrive at the scene.

In the BMW ActiveHybrid 5 the standard Driving Dynamics Control switch offers not only Sport+, Sport and Comfort set-ups (as well as Comfort+ mode if the optional

Dynamic Damper Control is specified), but also the ECO PRO mode. As an alternative to the standard 8-speed automatic transmission, an 8-speed sport automatic with faster shift times is available.

A number of BMW ConnectedDrive features are available for the BMW ActiveHybrid 5 including Park Distance Control, a rear-view camera, Surround View, High-Beam Assistant, Parking Assistant, Active Blind Spot Detection, Lane Departure Warning, BMW Night Vision with pedestrian recognition and Head-Up Display. Innovative technologies also allow in-car integration of smartphones and music players. The BMW Apps option offers unprecedented integration of the Apple iPhone.

To further enhance comfort and individuality, the standard 4-zone automatic climate control and Navigation System can be supplemented by options such as active seats, front ventilated seats, Comfort Access, the Smart Opener for the trunk, and high-end audio and rear entertainment systems.

**Design: Detailed indications of outstanding efficiency.**

Dynamic lines and precisely contoured surfaces give the body of the BMW ActiveHybrid 5 an unmistakable and expressive appearance that exudes a similarly assured presence, stylish elegance and a promise of pure sports sedan performance. However, the ActiveHybrid 5 stands apart from its siblings visually with the addition of design features hinting at the pioneering drive technology beneath the surface. These eye-catching touches bring into even sharper focus the car's exceptional efficiency – which, along with its hallmark BMW driving pleasure, outstanding comfort and uncompromising premium quality, defines the character of all BMW 5 Series models.

The typical BMW proportions of the ActiveHybrid 5 are headlined by a sweeping hood, short overhangs, long wheelbase and a roof line that swoops dynamically into the rear end. The front end, for example, is given expressive presence by the upright BMW kidney grille, V-shaped contours of the hood, broad, three-section styling of the air intake and powerfully flared wheel arches. The BMW ActiveHybrid 5 incorporates the brand's traditional kidney grille – which stands out with its galvanized slats – as a visual link to the engine behind it. The tops of the twin circular headlights, meanwhile, are leveled off by an accent strip, giving them the focused look typical of BMW cars. The daytime running lights feature visually distinctive LED light rings. Viewed from the side, the car's wedge shape underlines the sporty, forward-surgling character of the Sedan. Its silhouette radiates

a fine sense of balance, reflecting the even distribution of weight between the front and rear axles, while extra flaring around the rear wheel arches emphasizes the presence of rear-wheel drive. High-quality details, such as the particularly tight line of the Hofmeister kink at the base of the C-pillar, chrome-colored design elements containing integrated side indicators and the door openers recessed into the side design lines reinforce the Sedan's premium character.

**Open the door to understated refinement.**

In common with its BMW 5 Series siblings, the interior of the BMW ActiveHybrid 5 is characterized by its driver-focused cockpit design and impressive spaciousness. However, the hybrid model also contains a selection of custom touches that distinctly badges the ActiveHybrid 5 as the pure essence of BMW Efficient Dynamics with nameplates on the doorsills center console, engine cover and lithium ion battery cover.

Like all BMW 5 Series models, the BMW ActiveHybrid 5 boasts an instrument cluster with black panel technology. The rev counter, for example, also includes graphics detailing the electric motor's boost function for the energy flow as well as recuperation display. The instrument cluster of the BMW ActiveHybrid 5 also comes as standard with a 9.2-inch display for extended display capability. In addition to the standard navigation system, numerous other vehicle, entertainment and communications functions can be operated via the iDrive system, where the Control Display is integrated harmoniously into the Sedan's instrument panel.

**BMW ActiveHybrid 5: The only hybrid that is also a BMW 5 Series.**

The BMW ActiveHybrid 5 represents the next stage in the ongoing evolution of BMW EfficientDynamics. It's newly developed hybrid components that are combined with a BMW TwinPower Turbo inline-6 and 8-speed automatic transmission for the first time, and innovative functions for improved efficiency as well as driving enjoyment. At the same time it broaches yet another market segment, taking BMW's hybrid development work another step forward.

The 2012 BMW ActiveHybrid 5 arrives at US BMW Centers in March 2012 at a base MSRP of \$61,845.

### **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 339 BMW passenger car and BMW Sports Activity Vehicle centers, 139 BMW motorcycle retailers, 110 MINI passenger car dealers, and 36 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.

# # #