

The MINI production triangle in the UK. Contents.



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1. The new MINI and the MINI production triangle. (Summary)



The start of series production of the new MINI in September 2006 signals the start of a new production network for MINI comprising three UK-based BMW Group manufacturing facilities.

The MINI production triangle in the UK with its plants at Hams Hall, Oxford and Swindon has received substantial investment of nearly £200 million to build the new model and to increase MINI production capacity by up to 20 percent. The new production triangle employs in total 6,350 associates, a number set to increase by 450 to 6,800 in the medium-term as production nears the maximum capacity of 240,000 MINIs per annum.

Plant Hams Hall received around £30 million to build a new, advanced family of petrol engines especially for MINI. Previously all petrol engines had been supplied from a joint venture in Brazil. Output of the plant is set to increase significantly with the addition of MINI engines to its existing production of 1.6 to 2.0 litre BMW four-cylinder petrol engines. As output at the Oxford plant reaches full capacity at least 250 new jobs will be created bringing the total employed at Hams Hall to 1,000.

Plant Oxford received over £100 million to expand production capacity to 240,000 units a year in the medium-term, from 200,000 in 2005. The plant has invested in technology throughout the body shell production, paint and final assembly areas to increase production and become highly flexible in responding to customer choice with a range of options unrivalled in the small car sector of the market. A new paint process, introduced at the start of 2006, carries over to the new model and the body shop unveils its 15,000m² extension announced in February 2005. Up to 200 new jobs will be created at the plant as volumes increase towards the plant's maximum capacity bringing the total workforce to 4,700. The existing MINI Convertible will continue to be produced alongside the new model.

Plant Swindon received £60 million for MINI body pressing and sub-assembly technologies. The facility, which employs 1,100 associates, has passed through an extensive modernisation programme over the past three years and is now a fully integrated part of the MINI production triangle working with the very latest press and seam technology to the BMW Group's high quality standards. Building on its 50 year expertise of producing exterior body pressings such as bonnets, doors, side and rear panels, Swindon is now responsible for virtually all the body shell sub-assembly work, which is delivered directly from the Swindon plant to the body shop at Oxford.

In addition to higher production capacities, the integration of the locations in the MINI Production Triangle with their efficient logistics networks also results in increased flexibility. All pressings and body components are delivered just-in-time from the Swindon plant directly to the body production at the Oxford plant, without intermediate storage and, if necessary, within four hours of issuing the parts call-up. The engines from the Hams Hall plant are delivered just-in-sequence to the assembly in Oxford.

In addition to this efficient synchronisation of processes, the sophisticated logistics concept also enables a high degree of flexibility even after an order has been made. Customer requests for changes can be taken into account regarding colour, engine type or options up to seven days prior to the start of assembly. The underlying “Customer Oriented Sales and Production Process” (KOVPP) is unique in this form within the automotive industry. MINI customers therefore enjoy the benefit of being able to specify their cars in line with the extensive range of options available even after their order has been finalised.

In order that the three plants respond together to changes in demand and to customer requirements, flexible working and complementary shift patterns have been implemented across the three plants with up to seven day working and up to 140 hours production time per week.

As well as bringing a significant investment to the BMW Group’s UK operations, the UK-based supply industry will also benefit with key, large-scale components, such as the seats and the cockpit – known as modules – being sourced from within the UK. Three major suppliers have relocated their operations to be within one hour of the Oxford plant to respond flexibly to the requirements of customers. About 60 percent of components delivered to the Oxford plant are from UK-based suppliers.

2. The MINI production triangle in the UK: Flexible and efficient.



MINI now has its “Home of Production” in three plants. The production facilities at Hams Hall, Oxford and Swindon jointly produce MINI with increased capacity, flexibility and efficiency. The Hams Hall plant produces the new MINI petrol engines, Plant Oxford remains responsible for the body shell production, paint and assembly and Plant Swindon produces pressings and sub-assemblies.

The BMW Group has invested a total of almost £200 million in the production triangle for the production of the new MINI. The maximum production capacity for MINI will therefore increase from its previous level of 200,000 up to 240,000 units annually in the medium term. Since the start of the series production of MINI in 2001, worldwide demand has constantly surpassed the production capacity of the plant. The double-digit production increases achieved by means of production improvements have been exceeded every year by the increasing market demand. More than 850,000 built-to-order MINIs have rolled off the assembly line at the Oxford plant to date (September 2006).

At the start of series production about 6,350 associates will produce MINI across the three plants, 750 in Hams Hall, 4,500 in Oxford and 1,100 in Swindon. To achieve the maximum production capacity of 240,000 units, the BMW Group will create up to 450 additional jobs at the Hams Hall and Oxford plants over the medium term and increase the number of associates to a total of 6,800 in the MINI production triangle.

Efficient expansion and utilisation of existing production and logistics structures in addition to the use of the very latest production technology has been a priority in the investments made at all three plants for production of the new MINI. Only a small percentage was invested in the construction of new production buildings.

The wide range of options is one of the keys to the international success of MINI – meaning each customer can specify their own individual MINI. All production and logistics processes are directed towards this high degree of personalisation in line with the customer’s wishes. MINI production benefits from the “Customer Oriented Sales and Production Process”, (KOV) of the BMW Group, which optimises the entire process chain from the vehicle order up to the delivery of the car. A major benefit is that the customer’s requests for changing the colour, engine or accessories can be taken into account up to seven days prior to the start of assembly.

Sophisticated logistics are an essential basis for KOVP. The close proximity of the three MINI production triangle plants provides optimum conditions for this. This means that all pressings and sub-assemblies are delivered directly to the body shop in Oxford just-in-time from the Swindon plant located about 40 miles away and without intermediate storage. This can be done within four hours of releasing the parts order by data transmission to ensure that the optimum quantity of required components is available for the body shell production without unnecessary buffer stock.

The engines are delivered just-in-sequence and directly to the production in Oxford from the Hams Hall plant located approximately 70 miles away.

Through its use of working time and shift models, the MINI production triangle works with a high degree of flexibility in responding to market demand ensuring optimum utilisation of the production plants. The Oxford plant introduced its flexible working time models as far back as 2001 at the production launch of MINI, following the philosophy of the BMW Group production network. The Oxford plant currently manufactures across three shifts, seven days per week. The length of the individual shifts can be adjusted flexibly to market demand within a range of 25 percent.

In order that the three plants respond together to changes in demand and to customer requirements, flexible working and complementary working patterns have been implemented across the three plants with up to seven day working and up to 140 hours production time per week.

The extension of the supplier network for vehicle components is an important element in the structure of the MINI production triangle. Besides the BMW Group, numerous suppliers of vehicle components have invested in the production of the new MINI in the UK. For example, the three suppliers for the front end, cockpit and seat modules of the MINI have set up operations within a distance of just one hour's drive from the Oxford plant and, with a total of more than £40 million investment, have created about 750 new jobs. The delivery of these key components takes place via the just-in-sequence logistics concept. The Oxford plant transmits the exact sequence of the MINI production planning to its suppliers seven days prior to assembly. They produce the modules in accordance with the customer order and deliver them to the assembly hall exactly in time to meet the correct car.

About 60 percent of the components of the new MINI come from suppliers based in the UK compared to just 40 percent for the predecessor model.

3. Plant Hams Hall: MINI engines in the production programme.



Since opening in 2001, the Hams Hall plant near Birmingham has developed into the competence centre for the production of four-cylinder petrol engines within the worldwide BMW Group Production Network. The plant, which already produces all four-cylinder petrol engines for BMW brands, now takes over the assembly process of MINI engines for the first time.

About £30 million has been invested in the plant for the production of the new family of MINI petrol engines. The production facilities for the new MINI engines were integrated into existing buildings and extend the current product range of Hams Hall and will take annual total production volume to over 300,000 units. At the same time, the number of associates at the Hams Hall plant will also increase from 750 to approximately 1,000.

Synergies resulting from the production of both BMW and MINI engines at one plant will enable partial joint assembly and function testing of different engine families using the same facilities thanks to the flexible layout and management of the plant's engine final assembly. However, the sub-assembly of the cylinder head and certain other assembly operations require dedicated facilities.

At the beginning of the production process, each engine first receives its specific "passport" with exact technical data, the list of components and specifications for the assembly process. During the first assembly stage, a conventional conveyor system is used for the engines. Afterwards, the engines are transported by Automatic Guided Vehicles (AGVs), which are loaded with the corresponding parts depending on type and customer specification. The AGVs then automatically proceed to the correct workstations designated for specific assembly tasks and operations.

After completion in the final assembly area and undergoing the concluding function tests, both MINI and BMW engines come together in an automated engine store that can accommodate up to 4,500 finished engines.

The engines for MINI are delivered from Hams Hall just-in-sequence to the assembly line in Oxford exactly in line with production requirements. Specially developed IT and logistics systems are used to manage the production and quality assurance of the 16 different country-specific variants of the two main petrol versions of the new MINI engines (naturally aspirated and turbocharged versions).

Four days before the assembly of a customer's order at the Oxford plant, Hams Hall is informed which engine variants are required for the vehicles by means of electronic data transmission. The data is updated daily in order to guarantee that the engines arrive in the right order and at the right time.

The high level of flexibility of the engine production can also be seen in the material supply. The 264 engine components can be ordered from the suppliers with a lead-time of just five days. The entire production process, from the delivery of the engine components, right up to the complete assembly in the finished vehicle, is around seven days.

Specialists from Plant Hams Hall were integrated early into the developmental stages of the new MINI thereby preparing for technical integration and diversification of the production range at Hams Hall. This allowed for an initial pilot run with MINI engines several months before the start of series production to ensure the best quality and well-coordinated processes upon commencement of series production.

4. Plant Oxford: The MINI success story continues.



MINI production at the Oxford plant has developed into a success story in the automotive industry since the start of production in April 2001 owing to high global demand. Initial production forecasts of just 100,000 units per annum doubled to more than 200,000 units produced in 2005 within just four years of launch.

The BMW Group has invested more than £100 million in the Oxford plant since 2005 to integrate the production of the new MINI and increase production capacity up to 240,000 units per year over the medium term. As the plant nears full production capacity, 200 additional jobs will be created bringing the total number employed to 4,700 associates. The current MINI Convertible will continue to be produced along the new MINI.

Investment has mainly gone into the body shop and paint shop. The body shop area has been extended by approximately 15,000m² with flexible production technology. The paint shop has been working with a new and extremely efficient paint process since the beginning of this year and has installed a new second top coat line in order to increase capacity. Additional stations and new delivery points for just-in-sequence modules have extended the assembly line. The plant's Quality and Engineering Centre (QEC) was involved in the development of the new MINI at an early stage in order to ensure the integration of BMW Group's high quality and production processes.

Body-in-white.

The body shell production at the Oxford plant has been able to further increase its capacity and flexibility through close cooperation within the MINI production triangle. Since moving the production of sub-assemblies to the Swindon plant and extending the body shop, production capacity has increased by around 20 percent as well as having increased variant flexibility.

The different body models can be produced in any sequence. Besides the four body variants for the new MINI (left-hand/right-hand drive and with/without sunroof) and the four variants of MINI Convertible, the extended body shop also has the flexibility to include future MINI body styles.

This was achieved by integrating individual mobile production cells with standardised robot units, called MobiCells into existing facilities. MobiCells were developed by the BMW Group and are already being used at other BMW Group plants. MobiCells are built on a solid steel platen of standard

measurements. Welding robots and control systems are mounted on the platform by body construction specialists according to a defined basic pattern, pre-configured and tested. The fully functional MobiCells can then be connected to the power supply and integrated into existing systems in the plant within a few days. In this way, existing capacities of the body shop can be adapted flexibly and quickly without extensive modification of production areas. MobiCells are used at the Oxford plant in the sub-assembly and main assembly lines and are linked to the existing facilities by means of inter-process conveyor belts.

Existing production facilities in the body shop were modified for the new model and equipped with the latest control electronics. New framing stations have been installed for the higher bonnet and waistlines of the car. The number of welding robots has increased significantly from 229 to 429. The resultant body shell production is more than 95 percent automated and allows more than 4,000 welding points on the bodies to be joined precisely and quickly.

The use of the Perceptron laser quality check system with its measuring precision of 0.05 mm – half of the diameter of a human hair – has also been extended. The introduction of programmable in-line sensor robots means that production engineers can flexibly measure different areas on a body shell for dimensional precision during the production process.

Paint shop.

About half of the plant's £100 million investment announced last year has gone into modernising and increasing the capacity of the paint shop. The new MINI benefits from the innovative paint technology "Integrated Paint Process" (IPP) and an additional top coat line.

With IPP the process stage for applying and baking in the primer-surfacer layer has been completely eliminated. The primer-surfacer function is transferred to one of two newly developed base paint layers. In the "wet on wet" application of the two layers, the first layer assumes all functions and characteristics of the primer-surfacer coat, whereas the second base paint layer ensures optical qualities such as colour, effect and depth. The base paint is covered with clear coat as before. In this way IPP meets the same high standards as conventional paint processes in terms of optical and functional-protective effects of the paint.

The advantages of IPP are diverse. Area and infrastructure used for applying the primer-surfacer could be used for quickly and efficiently installing an additional top coat line. This has resulted in increased production capacity in the paint shop without the need to enlarge the production area footprint.

IPP also contributes positively towards the environmental targets of the BMW Group through the discontinuation of the solvent-based primer-surfacer. As a result, it has been possible to lower the emission and energy consumption of the paint shop significantly more than ten percent at the Oxford plant.

During the paint process, new automatic paint jets now apply the paint in a precise, horizontal process. This improves the glossy appearance of metallic colours and ensures the even distribution of the reflective particles on the body shell surface. The MINI's contrast roof paint still remains unique. Depending on the customer's order, the roof can be painted in a contrasting colour by a paint robot in an additional paint process.

The pre-treatment and after-treatment areas of the paint shop have also been extended in order to increase capacity. The number of robots has increased in the seam-sealing process from six to twelve, each capable of applying 17 metres of a new seam sealing material to a body shell using a new "flat-stream" technology. Six machining stations have also extended the hollow cavity sealing process which fills cavities with a wax-like preservative.

All body variants of MINI can be painted in random sequence in any of the car's 14 exterior colours.

Throughout the development of the new MINI paint shop technologists and engineers have been closely involved in the design of the body to ensure the highest standards of corrosion protection, paint appearance and finish.

Assembly.

The assembly line has been extended and new just-in-sequence delivery areas bring greater flexibility and efficiency. As a result, an additional twelve stations have been included on to the assembly line in order to integrate the new work sections like the sunroof assembly.

There are 372 different interior trim and 319 different exterior options for the new MINI. Allowing for all variant possibilities, it is theoretically possible to produce 1.5×10^{16} different MINI variants. Therefore it is extremely unlikely that two completely identical MINIs will leave the Oxford plant within the same production year.

The allocation of the vehicle to a specific customer order first takes place at the start of final assembly process. Since the introduction of KOVP, the painted bodies are considered logistically as an internal component supplied from within the plant. They are kept in temporary storage and channelled into the assembly process as soon as there is an order for the corresponding body.

The vehicle's allocation to an individual customer order takes place with the allocation of a Vehicle Identification Number (VIN). This late allocation allows for customer changes to be implemented until very shortly before the start of assembly.

Fifteen main modules are delivered just-in-sequence to the assembly line for the new MINI. This includes the engines, the complete front module with headlights, bumpers and cooling systems, the integrated door module, seats and cockpit. The assembly building has been extended to include new unloading ramps for the delivery of modules.

In the final assembly process, the doors are first detached and moved to a separate assembly line, before returning to the car to be re-attached at the end of the assembly process. During the assembly phase, associates mount up to 2,000 components on each MINI depending on the options ordered. Using special handling equipment, even heavy components can be lifted easily and rotated up to 90 degrees. Highly precise electric torque-controlled screwdrivers enhance the production quality and reduce the noise level in the assembly hall.

Numerous quality tests are integrated into the assembly process. For this purpose, associates are equipped with portable, wireless hand-held computers, which identify the vehicle with the aid of the scanned VIN. It then prescribes the specific test requests. After completing the assembly process, the vehicle undergoes an extensive programme of checks which includes testing on a rolling road and extensive electronic tests.

The extent of the involvement of the final assembly function is illustrated by the fact that it was involved in the first prototype build of a batch of new MINIs – not on special pre-production facilities but on the assembly line itself – more than a year before series production.

Quality and Engineering Centre.

The Quality and Engineering Centre (QEC) was specially built for the development and production of MINI. Engineers and technicians work in close cooperation with the research and innovation centre (FIZ) of the BMW Group in Munich on the introduction of new models and quality assurance for series production.

During the different stages of development of the new MINI, the engineering specialists in Oxford used their knowledge from MINI series production in the planning for the new car. As a result, all production requirements could be taken into account right at the start of the series production development to ensure optimum quality and process stability. Main suppliers were also involved at an early stage and were integrated into the project team in the QEC.

The QEC is also responsible for the quality measurement of all processes and operations at the Oxford plant – for the current and future production.

The same high standard in quality and work processes applies for the MINI production as in the entire BMW Group.

State-of-the-art facilities are available at the plant for testing and checking product and production processes. These include a test track with different road surfaces in addition to test rigs in the QEC building that are independent of outside weather conditions.

One new facility is an acoustics test rig, where vehicles can be driven on rollers in a sound insulated environment at all speeds whilst noise analyses are carried out. The hydraulic vibration test rig enables the simulation of chassis and body loads by vibrations of various frequencies and intensities on different test tracks. In the water chamber, 20 litres of water per minute spray onto the MINI from all sides to test vehicles for water ingress. Additionally, the vehicles are exposed to temperatures of – 40° to + 90° centigrade and different degrees of air humidity in the climatic test chamber in order to test that everything works perfectly in nearly every conceivable climatic condition.

Logistics.

Since setting up the production triangle in the UK, the transport routes of production components have been reduced considerably. Petrol engines for the new MINI now come from the UK and no longer from Brazil, and major sub-assemblies and pressings are mainly delivered from Swindon.

The BMW Group aims to reduce the environmental impact caused by the movement of components and vehicles as much as possible. Lorries used for transportation meet high Euro-5 standards. Moreover, the BMW Group has placed all transportation with one service provider that offers a collective system for all European countries, which combines the goods in transit into large cargos avoiding unnecessary empty runs.

Since 2001, MINIs destined for the European market have been transported using purpose-built rail wagons. This method of transportation by rail instead of by road saves over half a million lorry miles per annum.

5. Plant Swindon: MINI in focus.



As the new main supplier of MINI pressings and sub-assemblies, a new chapter has begun for the Swindon plant in its fifty-year history. It has now become the main supplier for the new MINI, meaning that about 90 percent of the pressings and almost 80 percent of the sub-assemblies for the car are produced in Swindon.

The BMW Group has invested about £60 million in the preparation for MINI production in Swindon during the past three years. The plant, with its 1,100 associates, has gone through an extensive restructuring and modernisation programme and works with the very latest pressings and sub-assembly technology in accordance with the high standards of the BMW Group. Productivity at the Swindon plant has increased by about 30 percent as a result of these measures.

Nineteen press lines with a total of 50 individual presses are used in the area of pressing production. All the presses have been extensively modernised with the very latest control electronics. The pressing power of the presses ranges from 400 up to 5,000 tonnes. The appropriate press is used in accordance with the size and complexity of the component.

The MINI bonnet and boot lid are formed in the longest press line by passing through a total of six press stages – from flat steel sheet up to the complete punched and press-moulded outer skin panel. Particularly large body parts, such as the doors, roof and body side sections pass over the four-stage large space press with a pressing power of 5,000 tonnes. The Swindon plant produces 280 of the 350 different pressed parts for the new MINI body shell. This not only includes simple components such as brackets but also particularly high-quality, exterior body panels and many of the car's steel parts which make up its internal structure, important for the rigidity of the body shell.

The production of entire sub-assemblies such as doors and bonnets is a new task for the Swindon plant. The new sub-assembly area incorporating a total of 135 welding robots was built in collaboration with BMW Group body shell production specialists, with Swindon associates training in close co-operation with body shell production associates at the Oxford plant.

The production stations for the different body components consist of individual modular platforms with welding robots and control units known as MobiCells. In contrast to conventional welding systems, MobiCells can be put into operation faster and have considerably more flexibility in the event of modifications to plant infrastructure.

The characteristic MINI bonnet, for example, is assembled from a number of individual pressings at a production station with 38 robots. Owing to the size and functionality of the component, exceptional precision is required. In addition to spot-welding in the production of the MINI body components joining processes with an innovative, high-strength adhesives are used.

New quality assurance systems were also set up for the manufacture of MINI. The optical sensor system, GOM, checks the cosmetic surface quality of the pressed panels. The Perceptron laser system used at all plants of the BMW Group is extended into the production at the Swindon plant.

This new phase in the plant's history is being mirrored in the re-development of the site; old buildings are being demolished and new facilities, including a tool room, upgraded working environments, refurbished offices and amenity areas are being developed.

A supplier is building a new steel warehouse in the area to optimise the steel supply. Most of the annual requirement of coils (more than 100,000 tonnes) will be stored there in future. As a result of this cooperation, additional area in the plant used in the past for storage, can be reallocated for production purposes.

6. Associates: Highly trained.



An essential factor for the successful production of MINI in the new MINI production triangle is its 6,300 associates. Training and development has a high priority at all three plants. The close cooperation of the plants enables joint usage of the different training facilities and programmes.

Special attention is paid to apprentices. A total of 170 (Hams Hall –15; Oxford –115; Swindon –40) follow one of twelve apprenticeship courses during their three to four year apprenticeship.

The Swindon plant has had a new training centre since the end of 2005. Here trainees with technical apprenticeships are employed directly in the tool and plant maintenance areas gaining production experience.

Hams Hall has been acknowledged as a national leader in training and skills development, with every associate qualified to at least “National Vocational Qualification level 2”, an entry-level non-technical apprenticeship qualification. An innovative modern apprenticeship scheme has given more mature associates development opportunities to acquire new skills as their length of service progresses. The plant was also one of the first companies in the UK to support the work-based Foundation Degree initiative; offering associates the chance to gain higher education qualifications.

7. Sustainable Production: Efficient resource management.



The BMW Group was the first major automotive producer to achieve the international environmental management standard ISO 14001 and the company's UK operations are committed to playing their role in promoting good environmental practice.

With rapidly rising energy costs the efficient use of energy is as much a commercial as an environmental issue. In each of the three production triangle plants energy and waste management is a key element in the overall manufacturing process.

At Plant Swindon an advanced radiant gas heating system has been installed to replace steam heating in a new tool maintenance facility. The benefits have been a reduction of about 950 tonnes of CO₂ emissions a year down to 350 tonnes whilst providing an improved working environment.

Plant Hams Hall has carried out a comprehensive energy audit showing that electricity is by far the largest source of energy used, with 60 percent for manufacturing processes and 40 percent for support services. Through a company-wide awareness campaign and specific energy reduction projects, the energy (electricity) used on average per engine produced has dropped sharply from 414 kWh in 2003 to 247 kWh in 2005.

Between 2003 and 2004, the plant reduced its total water consumption by seven percent. This was achieved by optimising the manufacturing processes and through improvements to the monitoring and management of the plant's water requirements.

At Plant Oxford, water usage is also a priority, with 70 percent of the total usage concentrated in the paint shop. A programme to reduce and recycle water has been in place since 2002 and each year the amount of water used in the paint process has been reduced, whilst the cleanliness of wastewater discharged has improved. Similar reduction programmes have been undertaken to halve oil and grease concentrations.

The introduction of the new Integrated Paint Process (IPP) also makes a positive contribution to the plant's environmental goals as the new system completely eliminates the solvent-based primer-surfacer in the paint process as well as offering emissions and energy savings of well over ten percent.

The Oxford plant operates a dedicated waste management centre (WMC) that investigates ways of reducing waste to landfill and to find alternative uses for waste material. Since it began operations five years ago the number of segregated waste streams has risen to 22 with new markets and technologies opening up for the re-use of materials. Since the centre opened the amount of compacted process waste sent to landfill has reduced by almost 50%. This equates to a reduction from 20 kg per car in 2004 to just 11.4 kg per car in 2005.

8. Community involvement in the MINI production triangle.



As well as stimulating economic development in their localities, all three MINI production triangle plants are playing their part in supporting their communities through numerous cultural and social activities.

Plant Hams Hall had the distinction of receiving a special achievement award for “excellence in Corporate Social Responsibility” from the British Quality Foundation at the UK Business Excellence Awards 2005.

Partners in the local community with whom Hams Hall shares its facilities, expertise and resources include Kingsbury High School, Good Hope Hospital, the Warwickshire Wildlife Trust and the West Midlands Biodiversity Partnership. In 2006, Hams Hall is supporting the Lichfield Festival as its “principal partner” for a third successive year and will also be supporting Birmingham’s College for International Citizenship once again by contributing to the learning module on sustainability with on-site discussions about environmental management.

Hams Hall supports the fund-raising activities of its associates through cash-matching schemes. The parent teacher association from Sheepy Magna Primary School in North Warwickshire, Cancer Research UK and the Mercia Multiple Sclerosis Therapy Centre based in Coventry are just a few of the many organisations which have benefited from donations of this kind.

Plant Oxford has selected fund-raising for Oxford’s Children’s Hospital as one of its main community projects through a variety of activities as the hospital aims to reach its target of £15 million. The plant’s longstanding involvement with the children’s hospital since the start of the appeal has also seen the plant donate a MINI to be raffled. Additionally the revenues from employee fundraising and from the ticket price of each paid-for plant tour given around the MINI production facility will go towards the appeal.

Last year, the MINI production at the Oxford plant was presented to more than 10,000 visitors during a plant tour. Besides national and international customer groups, the visitors also include groups of visitors from the region who are interested in the car production in their neighbourhood. The plant tour gives the numerous groups of school children a good opportunity to get a first insight into the working world.

Plant Oxford is also involved in the promotion of local art and culture. For over five years the plant has hosted the Creation Theatre Company who have presented a variety of plays at the plant that have been popular with theatregoers and associates alike. The plant is also a supporter of "Oxford Inspires" Oxford city's cultural agency that works with local arts organisations and business to promote social regeneration. This complements its involvement with the local Cowley Carnival, attended by over 20,000 visitors in 2006.

Plant Oxford's involvement with both Creation Theatre Company and Oxford Inspires led to its short-listing in two categories for the South East Arts and Business awards in 2006.

Plant Swindon is supporting the restoration of Swindon's historic, 260 acre, Lydiard Park, which had fallen into disuse and is now the subject of a £5.3 million scheme to reverse the decline in this famous parkland and provide a site of beauty and heritage for the people of Swindon. The plant is concentrating its help on the restoration of the 18th century coach house and stable building, for the benefit of local schools and community groups. This will include a multi-purpose classroom and facilities for community volunteers and horticultural apprentices working in the gardens.

9. The history of the MINI production triangle.



Plant Hams Hall.

The Hams Hall plant was built in 2001 by the BMW Group on a brownfield site near Birmingham with investment of £400 million. At this state-of-the-art facility, BMW four-cylinder petrol engines have been supplied to an increasing number of vehicle plants in the worldwide BMW Group Production Network.

In May 2006, the 750,000th engine built since the launch of the plant came off the assembly line. With the additional production of the new generation of petrol engines for the new MINI the total production volume is set to increase still further.

Plant Oxford.

In 1913, the first car was built in Oxford when William Morris, a keen racing cyclist, turned his attentions from repairing bicycles to assembling motorcars. The history of his car company began with production of the Bullnose Morris, so called because of the shape of its radiator.

The Oxford plant was built in its present form when Morris expanded in the 1930s. The production centre was built for the mass production of steel bodies, which had predominantly been built in batch production until then. After Rover Group was purchased in 1994 the plant came under the ownership of BMW Group. In 2001, it was completely modernised for the production start-up of MINI. BMW Group invested a total of approximately £280 million in MINI production at Oxford between 2000 and 2004.

Plant Swindon.

The Swindon plant was established in 1954 when the Pressed Steel Company (later known as Pressed Steel Fisher) needed extra capacity beyond its Oxford facility and bought land in Stratton St Margaret, on the outskirts of Swindon, to create a further car panel production facility.

It produced its first panel the following year, in 1955. From then onwards the facility became a major supplier of body panels to a number of car manufacturers and ultimately passed into the control of Rover Group and was acquired by BMW Group in 1994.

10. BMW Group: Significant contributor to the UK economy.



BMW Group in the UK.

The United Kingdom is the only country where BMW Group is represented by production plants for all three premium brands (MINI, BMW and Rolls-Royce). At the same time, the UK is the third largest market for the BMW Group worldwide. The company employs over 8,000 people at its different business locations in the UK and an additional 10,900 are employed at its 156 independent dealerships.

The operative activities of the BMW Group in the UK can be subdivided into the following main categories:

Manufacturing.

There are 4,500 associates currently employed at the BMW Group Oxford plant (production of MINI).

The number of associates in the BMW Group Swindon plant (production of pressings and sub-assemblies) is 1,100.

The BMW Hams Hall plant, North Warwickshire (production of MINI and BMW engines) employs 750 associates.

Rolls-Royce Motor Cars Limited, Goodwood (headquarters and manufacturing plant) employs 500 associates.

Sales and financial services.

Around 1,000 people are currently employed at BMW (UK) Ltd Bracknell (sales and marketing organisation for the BMW and MINI brands) and in the Vehicle Distribution Centre Thorne (vehicle preparation and delivery).

BMW Financial Services (GB) Limited in Hook, employs 300 people.

The economic impact of the BMW Group's operations in the UK (Economic impact study*).

The BMW Group's operations in the UK contribute significantly to the UK economy with sales of cars, motorcycles and engines totalling more than £5 billion. With production of MINI at Oxford and Rolls-Royce Motor Cars Limited at Goodwood, the BMW Group is now the third largest UK car producer, contributing £1 billion to the national economy.

Data produced by Oxford Economic Forecasting indicates that in 2004 the company's UK activities supported a total of more than 55,000 jobs – over 8,000 in its own businesses; 10,900 in the dealer network and a further 25,600 from supplier companies, with an additional 11,300 jobs in the retail, consumer goods and service sectors.

The report says: "During a time when UK manufacturing has struggled, the BMW Group has made a significant contribution to the UK economy. It has invested heavily and seen large leaps in production of MINI, a commitment to training rewarded with the success of its Hams Hall engine plant and a revitalised Rolls-Royce Motor Cars Limited relocated to new state-of-the-art production facilities in Goodwood."

As a major investor and exporter the BMW Group has spent around £900 million in upgrading its production facilities between 2000–2004. Exports of cars, engines and related goods in 2004 totalled £1.7 billion – nearly one percent of total UK goods exports.

As a taxpayer, the BMW Group contributes over £1 billion to the Exchequer through income tax, national insurance, corporation tax, business rates and VAT on car sales – equivalent to a third of a penny on the basic rate of income tax.

As well as this direct contribution the BMW Group's operations in the UK also have an important "multiplier" impact. The company's purchases of £1 billion of raw materials, components, capital equipment and business services from UK suppliers, together with £0.4 billion of purchases by the dealer network, contributed a further £1.4 billion to the UK's Gross Domestic Product (GDP). These purchases support 25,600 jobs in sectors such as metal, electrical equipment and textiles industries.

*The Economic Contribution of BMW Group to the UK, Oxford Economic Forecasting.

Moreover the purchases of those whose jobs depend on the BMW Group, both directly and indirectly, adds an estimated £0.5 billion to the UK's GDP and supports a further 11,300 induced jobs in the retail, consumer goods and services sectors.

Taking these direct, indirect and induced impacts together, Oxford Economic Forecasting estimate that, in total, the BMW Group contributes over £2.5 billion to UK GDP – equivalent to 0.2 percent of national income and supports over 55,000 jobs in the UK, 0.2 percent of total employment.

Media Information
13 September 2006

Production network launch for the new MINI.

Three UK plants link for MINI manufacturing.
£200 million investment. Capacity increases to 240,000 units.

Munich/Oxford. The start of series production of the new MINI also signals the start of a new production network for MINI comprising three BMW Group manufacturing facilities in the UK. The MINI production triangle in the UK with its plants at Hams Hall, Oxford and Swindon has received substantial investment of nearly £200 million to build the new model and to increase MINI production capacity by 20 percent up to 240,000 units a year in the medium-term. The new production triangle employs in total 6,350 associates, a number set to increase by 450 to 6,800 in the medium-term as production nears the maximum capacity of 240,000 MINIs per annum.

The UK Chancellor of the Exchequer, the Rt Hon Gordon Brown MP, was at BMW Group's Oxford plant for the start of production of the new MINI, along with the recently appointed Chairman of the Board of Management of BMW AG, Dr Norbert Reithofer, and guests from UK industry.

During his visit to Plant Oxford Dr Reithofer said: "The MINI has been an outstanding, international success for the company and our investment will ensure that we can build on this success in the future. Our new MINI production triangle has established a lean, efficient and flexible production network and allows us to continue to offer MINI customers unrivalled built-to-order flexibility in the small car segment."

Since the start of the series production of MINI in 2001, growing demand worldwide has constantly surpassed the production capacity of Plant Oxford, despite continuous production increases. More than 850,000 built-to-order MINIs have rolled off the assembly line at the Oxford plant to date, 75 per cent of which having been exported to over 70 markets worldwide.

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Plant Hams Hall has received around £30 million to build a new, advanced family of petrol engines especially for MINI. As output at the Oxford plant reaches full capacity the total number of BMW and MINI engines being produced at the engine plant will increase from 180,000 to more than 300,000 units a year in the medium-term. Based on this production volume at least 250 new jobs will be created bringing the total employed at Hams Hall to 1,000.

Plant Oxford has received over £100 million to expand production capacity from 200,000 to 240,000 units a year in the medium-term. The plant has invested in the latest technology throughout the body shell production, paint and final assembly areas to increase capacity and prepare for the production of the new MINI. Up to 200 new jobs will be created at the plant as volumes increase towards the plant's maximum capacity bringing the total workforce to 4,700.

The Swindon Plant has received £60 million for MINI body pressing and sub-assembly technologies. The facility, which employs 1,100 associates, has been through an extensive modernisation programme over the past three years and is now working with the very latest press and seam technology .

In addition to higher production capacities, the integration of the locations in the MINI production triangle with their efficient logistics networks also results in increased flexibility. All pressings and body components are delivered just-in-time from the Swindon plant directly to the body production facility at the Oxford plant. The engines from the Hams Hall plant are delivered just-in-sequence to the assembly lines in Oxford.

The sophisticated logistics concept furthermore enables a high degree of flexibility even after a customer has placed their order. Customer requests for changes can be taken into account regarding colour, engine type or options up to seven days before the start of assembly. The underlying "Customer Oriented Sales and Production

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Process" (COSP) is unique in this form within the automotive industry.

To enable the three plants to respond together to changes in demand and to customer requirements, flexible working and complementary shift patterns have been implemented across the three plants with up to seven day working and up to 140 hours production time per week.

As well as bringing a significant investment to BMW Group's UK operations, the UK-based supply industry will also benefit with key, large-scale components, such as the seats and the cockpit – known as modules – being sourced from within the UK. Three major suppliers have relocated their operations to be within one hour of the Oxford plant investing £40 million and creating 750 new jobs. In total about 60 percent of components delivered to the Oxford plant are from UK-based suppliers.

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BMW Group

Corporate Communications

Speech by

Dr Norbert Reithofer

Chairman of the Board of Management of BMW AG

Start of Production of the new MINI

Oxford, 13 September 2006, 9:30 a.m.

– check against delivery –



Chancellor, Your Excellency, Ladies and Gentlemen –

Thank you very much for joining us at today's press conference. I am very happy to be in the UK on this first business trip abroad as the new Chairman of the Board of Management of BMW AG.

Delivering a speech here in the UK is something very special to me as this is the only country in the world where the BMW Group has production sites for all our premium brands: BMW, MINI and Rolls-Royce. Two of them are of British origin – Rolls-Royce Motor Cars at Goodwood, and MINI here at Oxford. Both brands have a rich heritage, and we have a strong sense of commitment and pride for them.

And we are successful in the UK – not only in terms of production, but also in sales:

- With more than 45,000 MINI's sold in 2005, the UK is our leading market for MINI worldwide.
- For Rolls-Royce the UK is our second largest market.
- And with an annual retail volume of over 117,000 BMW automobiles in 2005, the UK is our third largest market for BMW worldwide.

I will focus on three key messages:

- First: The BMW Group benefits from an investor-friendly economic environment in the UK. In return, we are a strong partner for the UK economy regarding employment, purchasing power and our long-term investment policy.
- Second: Today we are celebrating the start of production of the new MINI. This brand is a success story which will continue with increasing momentum.
- And Third: We have set up a MINI Production Triangle between Hams Hall, Oxford and Swindon. We have invested nearly 200 million pounds to build the new model and to significantly increase production capacity from 200,000 to 240,000 vehicles.

Ladies and Gentlemen –

First about the role of the BMW Group as a partner for the UK economy.

I am very pleased that the Chancellor is here today. We were both here for the start of production event for the MINI in 2001. I assume you want to have a look at how we spent the money we invested here. I can assure you: we spent it in the right way!

When you became Chancellor in 1997, you announced your goal to develop an economy that would encourage investment in the UK, higher productivity and exports.

- Business leaders need economic stability when taking mid-term and long term investment decisions, especially in our industry where it takes a while until investments start to pay off. Chancellor, your handling of the economy has ensured the stability we need, providing the right environment for us to develop our business in the UK.
- We have not only invested in the latest technology but also in the skills of our workforce to improve process efficiency and productivity.
- And today, we export around 70 percent of our MINI production to over 70 countries.

According to an independent economic impact study, the BMW Group's operations contribute significantly to the British economy:

- on the product side with sales of cars, motorcycles and engines totalling more than 5 billion pounds,
- on the production and purchasing side – as third largest automotive manufacturer in the UK – with another two billion pounds.

My second message today is the success story of MINI. In July 2001, we introduced the first and still the only premium vehicle in the small car segment. The car incorporates the heritage of the brand. At the same time, it stands for a premium product substance, safety features, and the typical go cart feeling.

The MINI has been a great success for the BMW Group from the very beginning. I remember third party estimations of 100,000 cars per year – 100,000: this is exactly the volume we sold in the first half of 2006.

MINI is among the few cars that have not shown any decrease in orders even in the sixth year of production. Today, one out of seven vehicles delivered by the BMW Group is a MINI. We want to continue and, of course, increase the success of MINI with its successor. With the new model, we are presenting a thoroughly redesigned power train and a completely new engine. The MINI Cooper is powered by a 1.6 litre four-cylinder petrol engine with 120 horsepower, and the MINI Cooper S by a 1.6-litre turbo engine with 175 horsepower – both built at Hams Hall. We had to meet the enormous demand for MINI by increasing our production capacity and optimising our efficiency. And this leads me to my third topic: We have set up a MINI Production Triangle.

- The first point of this triangle is Plant Hams Hall. We shifted production to the UK from a joint venture in Brazil and have added the new MINI engines to the existing production of BMW four-cylinder petrol engines.
- The second point of the triangle is Oxford. We are expanding the production capacity from 200,000 units last year to 240,000 in the medium term. At the same time, we gain more flexibility. Our built-to-order flexibility – responding quickly to customers' changes in the configuration of their MINI – is currently unrivalled in the small car segment. This is one of the BMW Group's inherent strengths.
- The third point of the triangle is Swindon. This plant has taken responsibility for MINI pressing and sub assembly technologies. The plant is building on its expertise of producing outer surface body panels for 50 years.

Let me compile the facts about the new MINI Production Triangle:

- We have invested nearly 200 million pounds in the triangle and the production of the new MINI.
- We have increased production capacity by up to 20 percent.
- We have introduced new flexible shift models allowing for up to seven working days and up to 140 hours production time per week.
- And the number of employees will rise by 450 to a total of 6,800 as production nears maximum capacity.

Our purchasing strategy for MINI has resulted in substantial benefits for the UK economy by sourcing key, large-scale components – known as modules – from within the UK.

- Three major suppliers have set up new operations to be within one hour's distance of the Oxford plant, investing in communities and creating new jobs.
- For the new MINI, components provided by UK based suppliers have risen to 60 percent.

We are often asked: Why is the BMW Group so successful – worldwide as well as here in the UK? Why do we succeed in operating profitably here? It is our policy not to comment on competitor's business plans or on their operations. I'd rather point out our own strengths:

- the clear profile of our three premium brands,
- our focussed strategy,
- our outstanding products,
- lean production
- And our exceptional flexibility.

And one of our key strengths is our highly committed and flexible workforce: business is people.

Ladies and Gentlemen – in conclusion:

- The UK is an attractive business location for the BMW Group, and we benefit from a stable economic environment.
- The UK is the “home of the MINI” which meanwhile developed to a global brand. And we will continue to build on the brand's strength even more.
- And our MINI Production Triangle investment in the UK will significantly increase MINI production capacity and flexibility.

Ladies and Gentlemen – Thank you for listening.