

BMW Group.

Sourcing in Turkey and Expectations from casting suppliers.

Eşref Mermer.
International Purchasing Southeast Europe.

BMW Group



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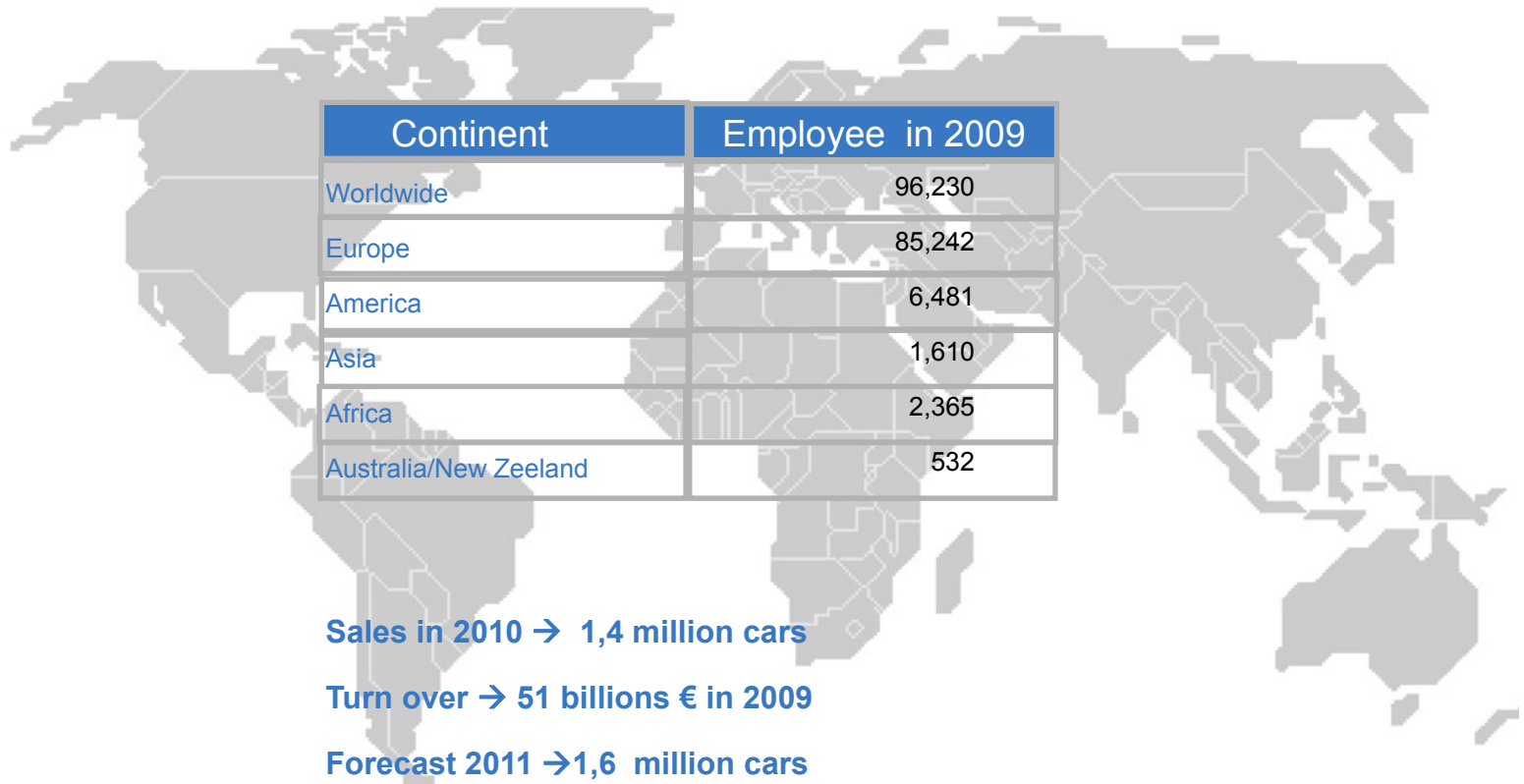
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BMW Group





Workforce and sales volume of the BMW Group.



Sales in 2010 → 1,4 million cars

Turn over → 51 billions € in 2009

Forecast 2011 → 1,6 million cars

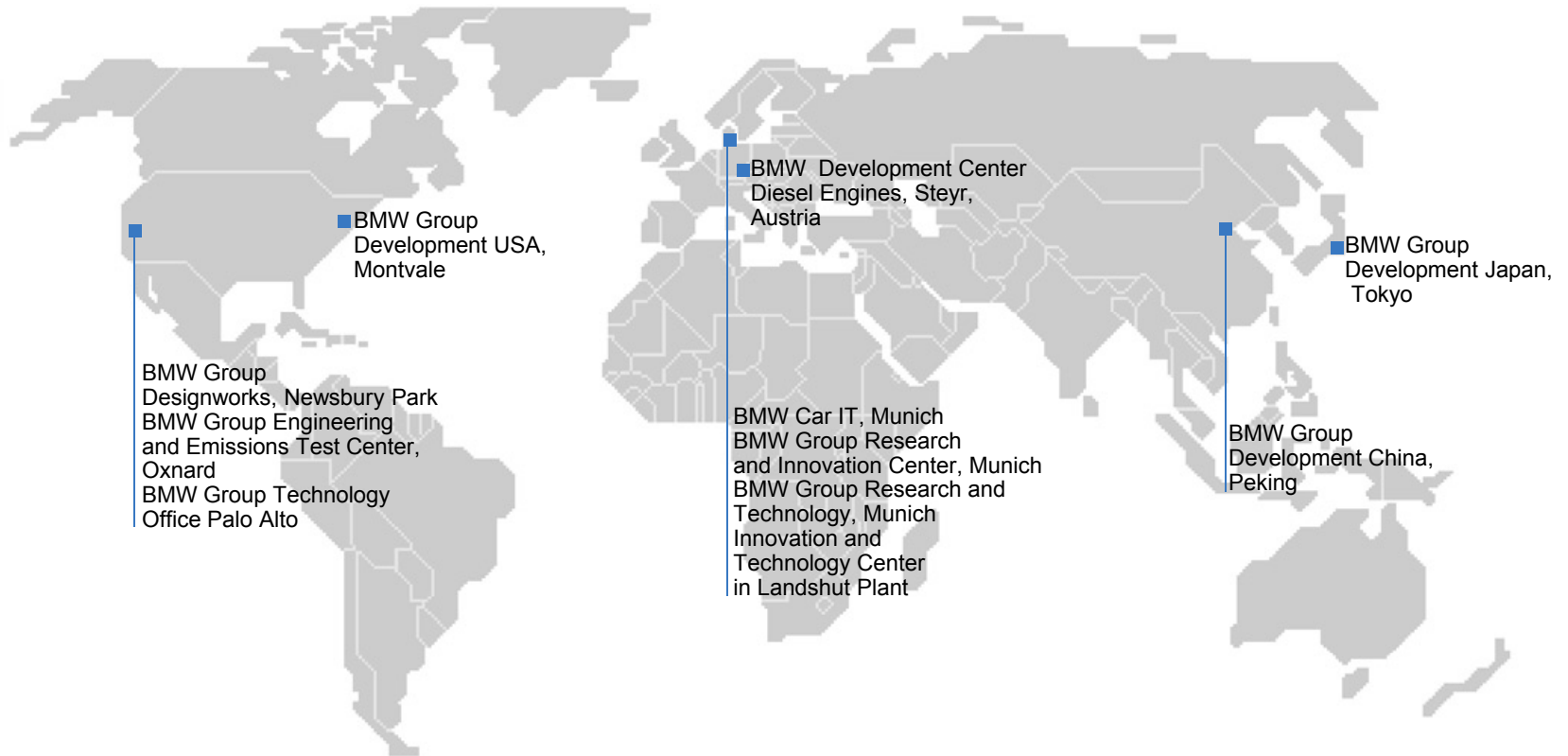
(biggest producer in premium segment)

Production plants of the BMW Group.



| Production Plants | |
|-------------------------|---|
| Munich, Germany | 3 Series; 8- and 12-cylinder petrol engines High-performance engines BMW M |
| Regensburg, Germany | Z4, 1 and 3 Series |
| Dingolfing, Germany | 5, 6 and 7 Series |
| Leipzig, Germany | 1 and 3 Series, X1 |
| Graz, Austria | MINI Countryman (Joint Venture with Magna Steyr) |
| Rossllyn, South Africa | 3 Series |
| Spartanburg, USA | X5, X6, X3 |
| Oxford, UK | MINI |
| Goodwood, UK | Rolls-Royce Phantom, Ghost |
| Shenyang, China | 3 and 5 Series (Joint Venture with Brilliance) |
| Berlin + Varese; DE + I | Motorcycles |

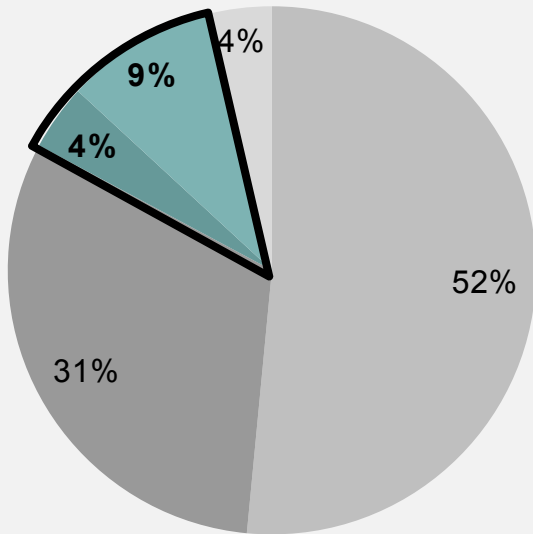
The research and innovation network of the BMW Group.





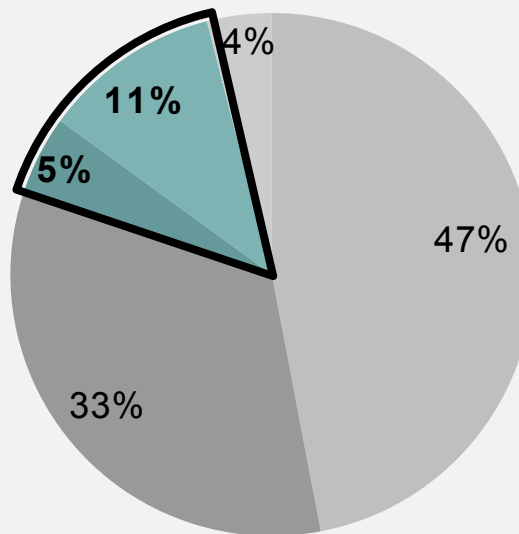
Global Sourcing.

Changing supplier structure. Increasing of sourcing in Asia and America.



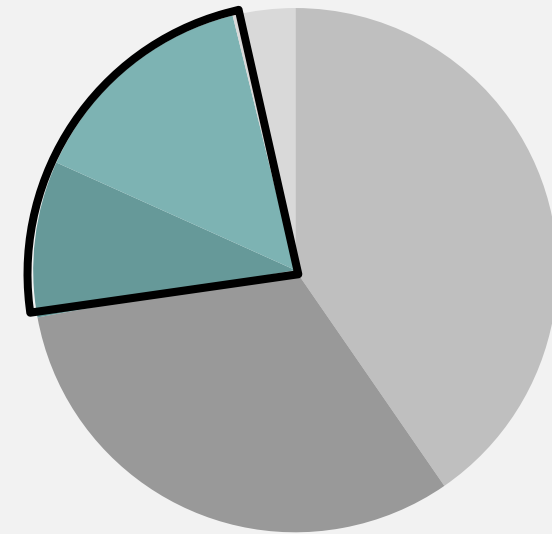
13%
Number of suppliers from Asia and
America

2005



16%
Number of suppliers from Asia and
America

2011



20-25%
Number of suppliers from Asia and
America

2014

Sourcing in Turkey

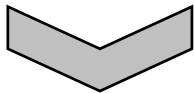


Concept

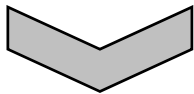
2007 Sept. – 2009 March → BMW Purchasing office in Istanbul managed by Eref Mermer
since April 2009 → Continuing of the activities from headquarter in Munich (after closing the office in IST)



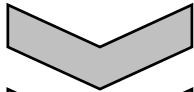
Process



1. Research of supplier market & finding out of interesting suppliers



2. Pre-Supplier-Evaluations (SPE) ; suggestions of possible suppliers to commodity buyer and other involved colleagues



3. Confirmation of supplier by cloverleaf decision circle (purchasing/ development/ quality/logistic) for sending an official inquiry



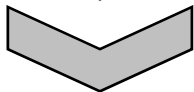
4. Starting of inquiry, supporting in preparation of the offers (Service Level Agreement (LSV); Technical Specification (LH) ; Quality Specification (QV), Quotation Analysis Form (QAF), Intern. Purchase Conditions (IPC), etc.



5. Presentation of supplier & quotations in Munich, negotiations + cost analysis



6. Supplier assessment (Audit) by members of cloverleaf

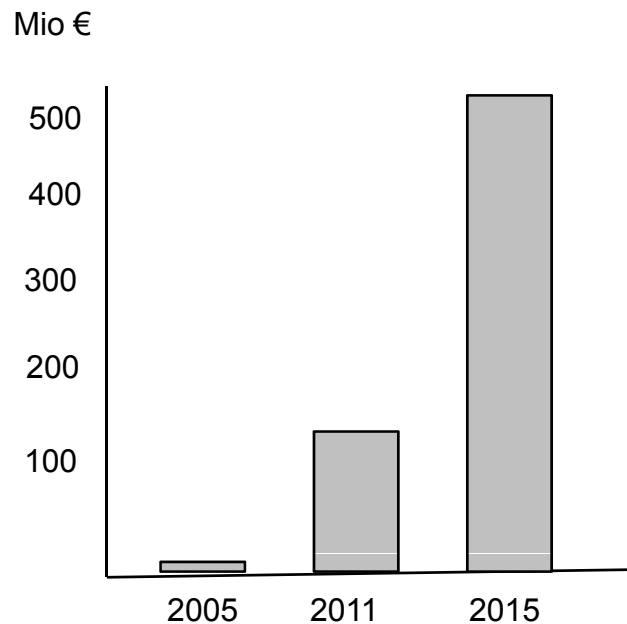


7. Supplier-Nomination in different decision circles

8. Supporting until SOP and EOP in cooperation with BMW resources



Sourcing in Turkey



- Since 2008 15 new projects (with development work) has been nominated by 10 Turkish local suppliers. 3 of them Alu-casting-companies
- At the moment, the development of the parts for the successor of 1 and 3 series cars with starting SOP in 2011 and 2012.
- Current inquiries for the new projects in lower segment and electrical cars at approx. 30 Turkish suppliers with good level in technique and quality.



BMW Expectations from the casting suppliers

What BMW R&D expects from you:

- **NOT expected a quotation based on BMW's concept model.
Your own concept is expected , based on your know-how and production capability**
- **A statement, whether you have design/production experience with a similar part.**
- **Detailed material specification of proposed alloy is requested**
- **Alternative technologies and materials to the BMW planning status**
- **An FE-analysis for your concept design based on BMW's requirement specifications (RS)**
- **Target weight defined in RS is a serious goal, which BMW considers as realistic
=> Either quotation on target weight, or on what you consider as realistic weight**
- **Do you have any ideas, how costs and weight of the component could be reduced?**
- **BMW prefers to work with CATIA V or compatible with this..**



BMW Expectations from the casting suppliers

- **A full casting simulation is requested**
- **Who will cast the parts, who will machine them, who will paint them and where?**
- **What does your casting process look like? machining concept and Capacity check**
- **A statement is necessary, that BMW's RS and QV (quality requirements) are understood, and from your point of view realizable**
- **A rough timing plan (project plan), including industrialisation process and layout**
- **How does your quality check concept look like? A list of quality checks in your proposal ; 100% crack detection mostly on the security parts**
- **A statement, which bench tests can be performed**
- **Component identification marking by Data Matrix Code (DMC) if possible, lasered and micro punched DMC**



BMW Expectations from the casting suppliers

Important Quotation-/Nomination prerequisites

| | | | |
|-----------------------|----------------|-------|---|
| metal basis | defined by BMW | €/kg | LME (High Grade Months Seller) Quarterly adjustments with average of last three months mit one month delay Basis for payment is finished machined weight |
| discarded metal basis | defined by BMW | €/To. | Quarterly adjustments with average of last three months with one month delay |
| Pricing | | | SOP Year (not only in €, also possible in other currencies) |
| Delivery conditions | FCA | | transport companies contracted by BMW |
| Packing | | | defined by BMW or proposal by supplier |
| Tooling Payment terms | | | 50 % at I.S.I.R. / 50 % with SOP |
| Development cost | | | payment conditions defined (amortisation or separat payments) |
| Quality offer | | | for the tasks in Service Level Agreement (LSV; under topic 5) (if not sufficient, for defining needed actions) |
| Contracts | | | signed Development Contract necessary signed Warranty Agreement necessary |



Challenges

- ▶ Increasing of quality requirements and increase of complexity of products with challenging cost targets (Best Practise, Real Value)
- ▶ Co-design and development suppliers required
- ▶ Down-Sizing, common parts und immense fluctuation in volumes
- ▶ Significant increases of market demand in Asia and necessity of localisation especially in China
- ▶ In next future about 30 % reduction of capacities in western Europe or moving the volume to other regions (BCC)

In case of Turkey

- ▶ the cost of energy and raw material not competitive (same level as Germany), and disadvantage due to transport cost. But compensation possible by engineering and machining for complex parts
- ▶ Buying parts in gravity casting in Turkey makes more sense then high pressure die casting (bigger labour cost portion and at the moment only one important supplier)



some important components of BMW

high pressure die-casting

- Sumps / sump top
- Cylinder head cover
- Chain box lid
- Gearbox Housing
- Engine bearer
- Oil filter case
- Climate compressor bearer
- Bedplate
- Brackets (motor and gearbox)
- Covers
- Dashboard carrier
-

low pressure or gravity die casting

- Wheels
- Wheel carrier
- Swivel bearing
- Axis components
- Levers
- Differential cases
- Cylinder heads
-

Iron Casting

- Differential cases
- Differential carriers
- Swivel bearing
- Crankshafts
-

yearly BMW-Purchase Volume approx. : 2.000 mill. € (+ 500 mill. € 2nd Tier)

P.S: Components are also produced by **BMW Foundry in Landshut** (s. next page)



BMW Foundry in Landshut

Center of Competence of light metal casting in **Aluminium** and **Magnesium** with experiences in project development and big serial production since 1986

Basic Data

- Good castings : 45.000 tons and 2,7 million parts per annum
- Employees : 1.350
- Space : 110.000 square meters
- Energy consumption (per annum) :
 - electricity : 30.000 MWh; water: 45.000 m³; gas: 12.000.000 m³

Casting Processes and produced parts

- Sand Casting (Small Lots, Prototypes, Formula 1)
- High Pressure Die Casting (Crankcases [Al and Mg], Structure Components)
- Low Pressure Die Casting (Cylinder Heads, Crankcases, Inserts)
- Gravity Die Casting (Cylinder Heads, Chassis Parts, Knuckles)
- Lost Foam Casting (Cylinder Heads)

Notice :

•BMW Foundry Landshut won „**Automotive Lean Production Awards**“ 2010 in category „ **excellent whole system** “ and has also **Consulting and Supporting** activities in technology, development, production and quality issues, if necessary or if the suppliers wish...



Thank you very much for
your attention