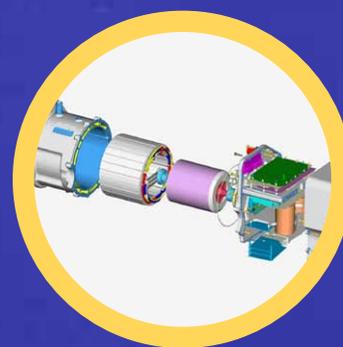


# Global market review of automotive electric motors – forecasts to 2017

2010 edition



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By Matthew Beecham

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Seneca House  
Buntsford Park Road  
Bromsgrove  
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B60 3DX  
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Tel: +44 (0)1527 573 600

Fax: +44 (0)1527 577 423

Web: [www.just-auto.com](http://www.just-auto.com)

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### Chris Clarke

Research manager, [just-auto.com](http://just-auto.com)

Tel: +44 (0)1527 573 615

Email: [chris.clarke@just-auto.com](mailto:chris.clarke@just-auto.com)

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# Preface

## Research methodology

This report is intended to provide an overview of automotive electric motors, providing top level market fitment, volume and value forecasts through to 2017. Our forecasts are not extrapolative but dependent on the underlying drivers of supply and demand. Our forecasts are largely based on interviews with the author's extensive international network of industry contacts. This allows us to consider and explain the meaning and implications of industry events, rather than offer simple description based on incomplete data.

Our approach is divided into two distinct methodologies:

- qualitative interviews – these are generally opinion-based, which aim to build knowledge about future automotive electric motor market trends and company strategies;
- quantitative interviews – typically fact-based, focused on establishing market values, shares, and volumes.

Our research typically concentrates on applications for light vehicles which include all cars, light trucks and the various cross-over vehicle styles such as sports utility vehicles and people carriers. These vehicles collectively account for about 96% of the global vehicle build.

Our market forecasts are set out by major light vehicle-producing region, i.e. Europe, Japan, China and North America. For the purposes of this report, except where expressly stated, 'Europe' includes Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Switzerland, Sweden, Turkey and the UK. North America includes the US, Canada and Mexico.

Given the current state of the industry, *just-auto* has completely revised its estimates and forecasts of the vehicle electric motors market volumes and values. This report sets out our revised forecasts in Europe, Japan and North America. In addition, and given the sheer volatility of the global economy at present, we have set out an 'expected', 'best case' and 'worst case' scenario

applied to vehicle seating. On balance, we believe this will provide readers with a more realistic framework for our electric motors forecasts.

### **Report coverage**

In this, the sixth edition of this report, *just-auto* reviews the key market drivers for electric motors, and updates the market analysis. Following our market overview in Chapter 1, *just-auto*'s product fitment forecasts in Chapter 2 predict the market (by volume and value) in Europe, Japan and North America for electric motors for electric parking brakes, rearview mirrors, seat adjustment mechanisms, steering systems, sunroofs, window lift mechanisms and wiper systems. Our estimates and forecasts range from 2007 to 2017 for each region. Chapter 3 sets out profiles of the major manufacturers, namely ArvinMeritor, Bosch, Brose, Denso, Globe Motors, Johnson Electric, Mitsuba and Nidec.

### **The author**

Matthew Beecham has more than 18 years' experience of researching, writing and analysing market and technical trends in the global automotive components industry. Since 2000, he has served as an associate editor for *just-auto*. In addition to electric motors, he authors a range of global auto components' market research reviews, including batteries, braking systems, clutches, coatings, cockpits, driver assistance systems, door modules, engine cooling systems, exhaust systems, front-end modules, fuel injection, fuel tanks, glazing systems, ignitions, interiors, lighting, mirrors, roof systems, shock absorbers, spark plugs, rotating electrics, tyres, tyre pressure monitoring systems, wheels and wipers. Matthew's freelance assignments have included working for AT Kearney, Belron, Bridgehead International, McKinsey, Kuwait Institute for Scientific Research, Motorsport Industry Association, Motor Industry Research Association and the Economist Intelligence Unit. He has also written for magazines including *Car Graphic* (Japan), *JAMA* (Japan) and *Automotive Engineer* (UK). He was awarded a PhD in automotive technology transfer from Cranfield University.

# Chapter 1 Introduction

Electric motors perform a variety of functions that were formerly consigned to cranks, gears and levers. They are typically found in anything that has an electrical movement or solenoid function – such as window-lifts, fuel pumps, mirror and headlamp adjusters, ABS, clutches, automated manual transmissions, parking brakes and steering systems.

Although electric motors have long since been used to power certain vehicle componentry, such as wiper systems, these markets have matured. Meanwhile, growth markets are appearing. For example, manufacturers predict significant growth with gearbox actuators (used for double clutch automated transmissions, actuation for transfer cases and torque distribution differential gears), power steering motors and electric machines for hybrid vehicles.

Manufacturers also expect to see more DC electric motors used in automotive interiors in the future, since there is a general trend towards more electrification. This means that many manual functions, even in the lower vehicle segments, will increasingly be electrically operated. Meanwhile, the use of actuators is also on the rise. Particularly when it comes to convenience features, such as backrest adjusters, the new electric actuators are becoming increasingly prevalent.

In the power window department, manufacturers report a growing need for smaller, lighter motors to fit in the increasingly slim doors of modern cars. On the wiper motor front, manufacturers note that reductions in weight and size as well as the improvement of exterior appearance are priorities for windscreen washer systems.

Manufacturers of brushless DC motors are also pushing to develop smaller motors yet maintain power and speed. Overall, it is clear that the driving force behind market growth is motorists' insatiable demand for safety, comfort, economy, a clean environment and overall quality of driving.

## Chapter 2 The market

### Defining the elements

According to Nidec, there are two kinds of DC motors: brush and brushless. Brushless DC motors differ from conventional brush DC motors in that the current which produces mechanical energy is applied to stationary coils via electronic switches without physical contact with the rotor, rather than stationary rods brushing against the rotating coil. Nidec points out that conventional brush DC motors have several limitations: brush life, brush residue, maximum speed and electrical noise. By avoiding friction, sparks and the wearing and fragmenting of the brush rods, brushless DC motors provide cleaner, faster, more efficient and quieter operation and longer maintenance-free life than conventional brush DC motors. Although brushless DC motors have many advantages over brush DC motors, Nidec says the use of brushless DC motors is still mainly confined to precision applications in disc drives and industrial motion equipment that require high efficiency, smooth operation and precise speed control.

Besides standard brushless DC motors, mainly found in body and convenience areas of the vehicle, manufacturers report that permanent magnet brushless DC motors are already standard (for power steering and drives for hybrid vehicles) or will gain major importance (such as for gearbox actuation).

### Market players

The main manufacturers of electric motors include ArvinMeritor, Bosch, Brose, Denso, Globe Motors, Johnson Electric, Mitsuba and Nidec. This section sets out some thumbnail profiles of the main players and concludes with a summary of the electric motors supplied by each company.

#### ArvinMeritor

ArvinMeritor's Light Vehicle Systems business supplies body systems (roof and door systems), chassis systems (suspension systems, suspension modules and ride control products) and wheel products for passenger cars, all-terrain vehicles, light trucks and sport utility vehicles to OEMs. More specifically, the company is a major supplier of integrated door modules and systems, including manual and power window regulators and latch systems. Its

## Chapter 3 Manufacturers

### ArvinMeritor

In May 2008, ArvinMeritor announced its plan to spin-off its Light Vehicle Systems (LVS) business to ArvinMeritor shareholders, with its Commercial Vehicle Systems business remaining with ArvinMeritor. Since then, the company has completed the sale of its entire ownership interest in Gabriel de Venezuela and Meritor Suspension Systems Company (finalised in October 2009) joint ventures; and sold both its wheels business and Gabriel Ride Control Products North America.

Consequently, ArvinMeritor has revised its reporting segments following these recent divestments. For continuing operations, the company will now report results as defined within Commercial Truck, Industrial, Aftermarket & Trailer and Light Vehicle Systems. Of these four segments, Commercial Truck, Industrial and Aftermarket & Trailer are considered core to ArvinMeritor's business.

Today, its Light Vehicle Systems business supplies body systems (roof and door systems), chassis systems (suspension systems, suspension modules and ride control products) and wheel products for passenger cars, all-terrain vehicles, light trucks and sport utility vehicles to OEMs.

More specifically, ArvinMeritor's Body Systems' business itself is comprised of three product areas, namely:

- door products – manual and electric window regulators; door modules in steel and plastic; access control latching and closure system for vehicle apertures;
- roof products – sunroofs, large-opening sunroof systems and complete roof modules;
- the company's proprietary 'smart systems' – electric motors and electronic control systems for window and roof applications.

ArvinMeritor's Light Vehicle specific products designed with smart systems methodology includes:

- active roll control systems;
- air suspension systems;