

A new era

Accelerating toward 2020 —

An automotive industry transformed



The transformations to come

At least now, the picture is clear

For the past few years, automotive leaders and observers have witnessed an industry in peril. A slowing global economy, coupled with declining consumer confidence, has translated into dismal new car sales in most markets.

But the slump has masked many outstanding industry advancements. Standards of quality and productivity, for example, have been raised without a corresponding increase in price. Cars today are safer, more fuel efficient, and more technically advanced than ever. And, the automotive workplace has evolved from an image of “dark, dirty and dangerous” to an environment of high skills, advanced technologies, and dynamic change.

Despite this, competitive and financial pressures have led to a number of high-profile bankruptcies. Production utilization in North America, Western Europe, and Japan has dropped dramatically leading to widespread job losses. Even with discounts and other purchase incentives, consumers, wary of an uncertain economic future, have yet to return to the showroom without extraordinary government incentives.

So, what will be the shape of the automotive industry as the world emerges from the economic downturn? In this report, Deloitte Touche Tohmatsu’s senior automotive leaders offer a perspective on the structural changes and major customer, technology, and people trends expected to transform the industry over the next decade.

A massive shift in the competitive landscape will see China and India emerge as major players in the industry. These markets will join Western Europe, Japan, Korea, and the United States as the centers of design and manufacturing for original equipment manufacturers (OEMs) and their suppliers.

By 2020, as few as ten volume OEMs groups based in these six major markets will account for 90 percent of global sales. To remain competitive,

each will rely on higher volume global platforms supported by networked design centers in key emerging markets.

An era of “conscious consumption” will emerge. Customers around the world will be more cost conscious, especially in the developing world where millions of drivers will make their first ever car purchase.

Environmental considerations will also weigh heavily on the industry towards 2020. The fierce race to develop and produce electric vehicles, spurred by both customer demand and government incentives, will mean that up to a third of all cars purchased in developed countries in 2020 will not be propelled by an internal combustion engine.

This technological imperative will escalate an already intense war for talent by 2020. The workforce of the future will not only need more complex skill sets but will also need to be flexible so that companies can employ them most productively. At every level, a more proactive approach to training will be implemented, as part of a more progressive and comprehensive approach to talent management. The challenge to attract highly skilled workers will be especially acute in developed markets. Emerging markets, with their younger demographics and plentiful engineering talent, will pick up the slack left by the talent shortage.

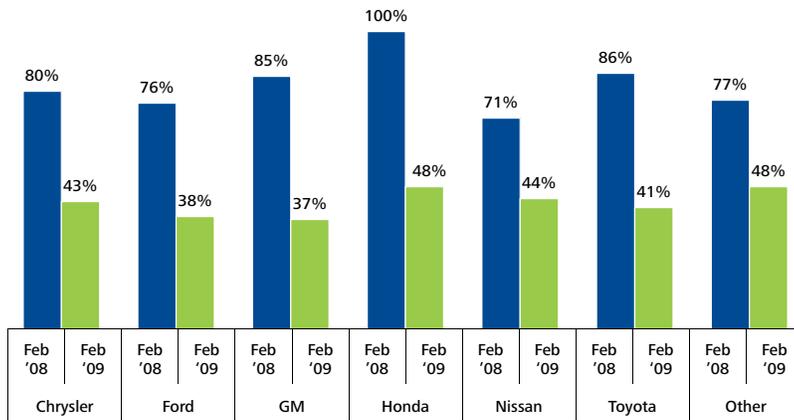
What must not be lost in any of this is the increasing role of government. Governments in all major markets have become active industry players. Their investments through emergency loans and incentive packages will have a lasting impact on the industry’s direction. The nature of their continued support to domestic companies, as well as energy and environmental policies, will do much to mold the automotive sector over the next ten years.

To be sure, there will be no resumption of the status quo. Automakers and their suppliers will need to reinvent themselves to meet the challenges of a dramatically new global automotive landscape.

The restructuring imperative

The current economic crisis has accelerated deep structural change in the automotive industry, setting the stage for sustainable growth. High-cost exporting countries will see domestic capacity closed as vehicle production continues to migrate to the “new Detroit’s”: Lower-cost centers dotted across India and China and other locations in the regional trade zones of North American Free Trade Agreement (NAFTA) and the European Union. High-volume global platform architectures will become the norm. And, convergence will drive the emergence of new business models characterized by alliances with players from other industries to support new technologies.

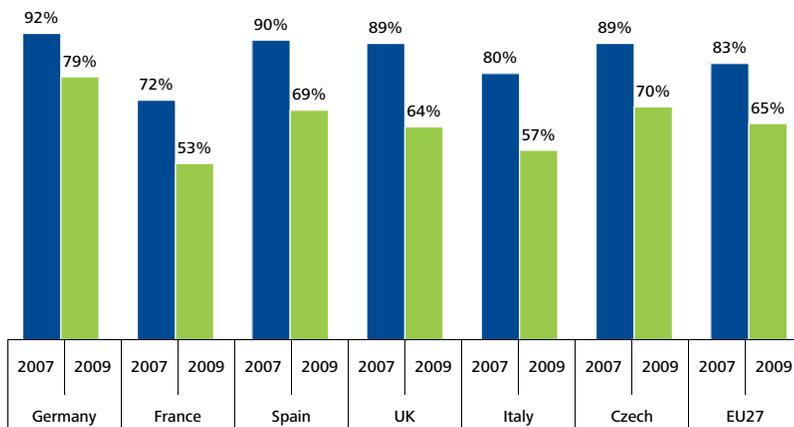
Figure 1: NAFTA light vehicle assembly capacity utilization (Feb 2008 vs. Feb 2009)²



Source: Ward's Auto, Data Reference Center

A recalibration of the automotive industry value chain is in motion. The marked decline in sales over the past three years led to excess capacity in plants around the world, including North America and the European Union (see Figures 1 and 2). Some of the numbers are startling: Like most of its competitors, for example, Honda went from full capacity in February 2008 to utilizing less than half capacity (48 percent) a year later.¹ Profitability for OEMs has been hurt and margins for suppliers have sunk below the break-even point, triggering reduced capacity, resourcing to stronger suppliers, a rash of bankruptcies, and in some cases, the need for government bailouts.

Figure 2: European Union light vehicle assembly capacity utilization (2007 vs. 2009)³



Source: Ward's Auto, Data Reference Center

Of course, the crisis will not last forever and short-term sales projections foresee over 70 million units sold worldwide by 2015 (see Figure 3). While opinions differ about the timing of the turnaround, there is no doubt that the structure of the automotive industry will be deeply transformed.

The decline of Detroit

Once the core of the global automotive industry, Detroit's influence has declined steadily over the past few decades. Sales of signature models have been slowed by the waning popularity of large cars and Detroit's struggle to compete in the small car segment. What's more, Detroit has already lost its leadership in engineering. Most cars manufactured in 2007, for example, had their primary development in Asia and Europe and this trend is expected to continue into 2015 (see Figure 4).

The rise of manufacturing in lower cost regions

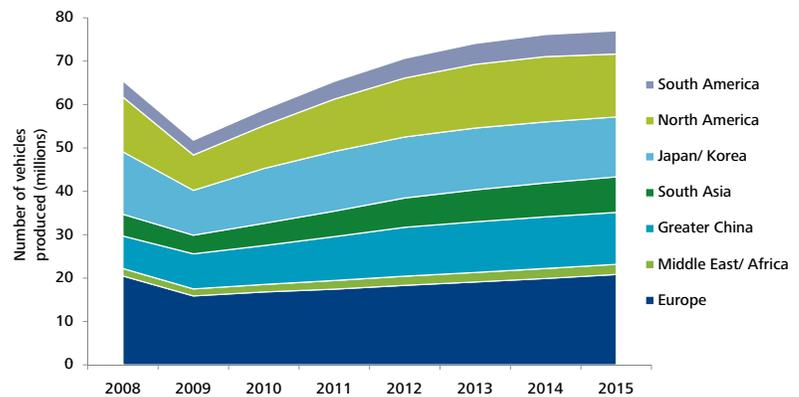
The move to lower cost regions will be driven by two forces: Cost and demand. The cost of labor in emerging markets continues to be a fraction of that in the developed world (see Figure 5). To take advantage of the expanding population in emerging markets, OEMs will continue to shift more of their production to be closer to their biggest source of new customers. For example, Greater China and South America will represent more than 50 percent of growth in global light vehicle production from 2008 to 2015⁴.

“As the volume of cars sold in these emerging markets rises, it will be increasingly necessary for OEMs to move closer to the demand centers,” says RC Bhargava, Chairman, Maruti Suzuki India. “This will be for competitive reasons, which are stronger than the lower cost reasons. Engineering for the local customer is also critical, making it another major driver.”⁵

The expected growth of trading blocks (e.g., NAFTA, European Union, ASEAN, and Mercosur) will drive continued development of regional production systems, with a migration to lower-cost locations within each region. High exchange rate volatility and rising transportation costs have led OEMs and suppliers to focus more on low-cost sourcing within a region. OEMs will increasingly look to balance production and sales footprints to reduce exposure to adverse exchange rate shifts. The overall effect of this shift is that by 2020, there will be fewer cars sold as imports from outside a trade zone (e.g., Korea to the United States or Japan to the European Union). Even those cars with foreign labels will be produced regionally. For that reason, OEMs welcome the emergence of broader trade agreements that support greater flexibility.

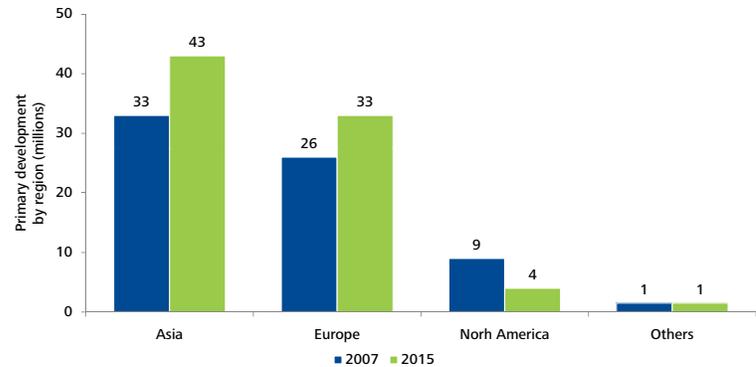
The new pockets of low cost areas within the region will become hubs for OEMs at the expense of higher cost exporters such as Spain and Germany (in the

Figure 3: Light vehicle production forecast (millions of units)⁶



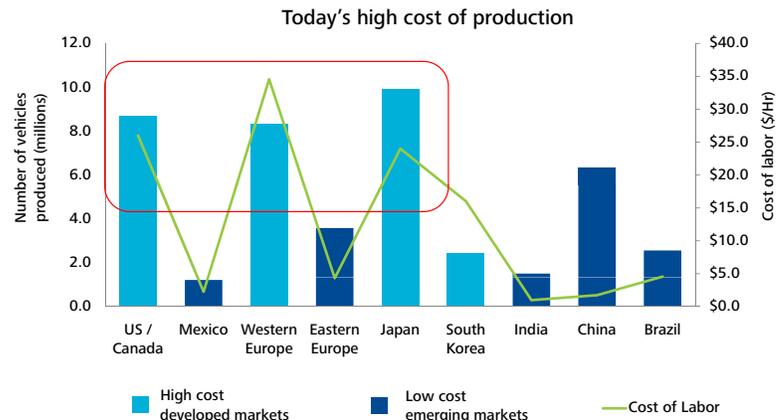
Source: CSM Worldwide

Figure 4: Falling primary development in North America⁷



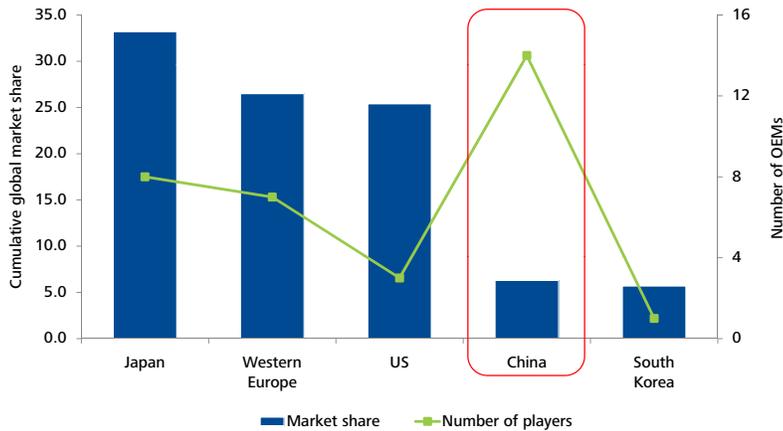
Source: CSM Worldwide and Automotive News

Figure 5: Labor cost comparisons (\$/Hour)⁸



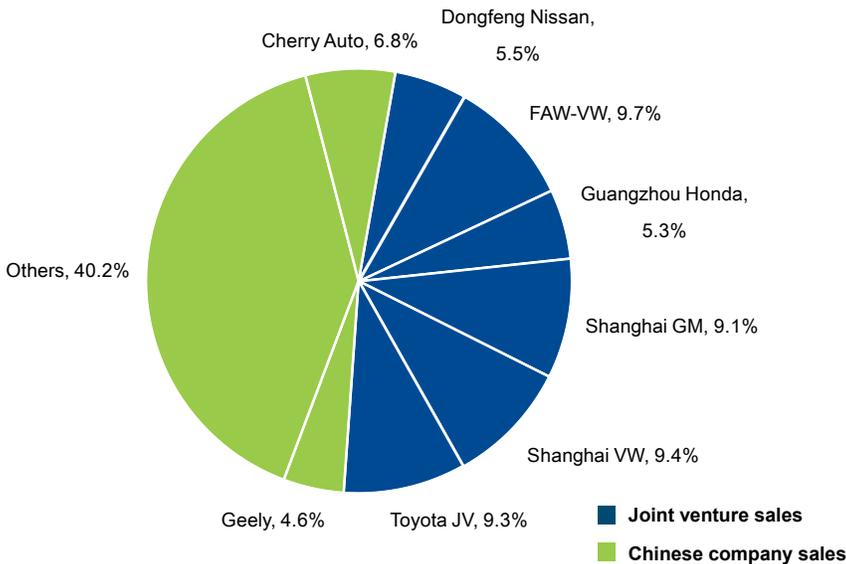
Source: Cost of Labor – Economic Intelligence Unit, Data Dictionary, Total Production 2008 – Ward’s Automotive Data Reference Center

Figure 6: Share of production among top global OEMs producing 50,000 units in 2007¹⁴



Source: Automotive News, Data Center

Figure 7: Joint venture sales represent nearly half of all Chinese automotive sales¹⁵



Source: Ward's Automotive Data Reference Center, China Sales by Company

European Union) and the U.S. and Canada (within NAFTA). This strategy is already unfolding. Suzuki, for example, established plants in Hungary to supply the European Union, while Volkswagen and Nissan manufacture in Mexico to supply the members of NAFTA.⁹ Renault is building a full-scale assembly plant in Morocco that will produce Logan-based cars for global export, mainly to Europe, starting in 2010.¹⁰

China on the move

Before a Chinese company establishes itself as a leading global producer, the industry will undergo a period of deep consolidation. This will reverse the relatively weak global market share position of Chinese OEMs today (see Figure 6). In the near term, the Chinese government plans to consolidate the top 14 local automotive players into 10 with a domestic market share in excess of 90 percent. Within the top 10, the government directive is for two or three to attain annual output of two million units and four or five to produce one million units annually.¹¹ In most segments, the supply base is expected to consolidate 30 to 50 percent.¹²

The government mandate also encourages automakers to develop their own brands, with a target of boosting the share of Chinese domestic brands to at least 40 percent of the national market. Meanwhile, domestic Chinese manufacturers have been charged with exporting up to 10 percent of their product.¹³

Chinese OEMs will find themselves in a fierce battle for supremacy in their own market. Management is highly motivated to stake their position and prove to Beijing that they deserve to be among the chosen few to lead China's foray into the global automotive market.

Currently, the Chinese industry is also characterized by a high number of joint ventures with established players. The arrangement has provided Chinese companies with auto-making expertise, while also providing the only way into the Chinese market for their partners (see Figure 7). However, most of the

intellectual property remains in the hands of the foreign joint venture partners.

Important questions remain about the future of joint ventures in China. All eyes are on Beijing as they decide whether to allow greater foreign ownership or tighten restrictions to protect the fledgling domestic producers.

Consolidation and a new global balance

Consolidation is well underway and today 10 global OEMs account for over 77 percent of global production (see Figure 8). Fiat has taken over Chrysler and Volkswagen has swallowed Porsche. Deals like these increase scale, streamline distribution, boost asset efficiency, and provide access to previously limited markets.

In some cases, companies will make targeted acquisitions to gain access to new markets, channels, or technologies. In others, companies may adopt 'roll up' strategies and make multiple acquisitions to rationalize capacity in a market niche and develop a dominant position.

A new breed of players will emerge, as well as a new global balance — with more competitors headquartered in emerging manufacturing hubs, particularly in India and China (see Figure 9). When the dealing is done, the landscape will be dominated by global OEMs and suppliers based in six major markets: Western Europe, Japan, the United States, Korea, China, and India. The Renault-Nissan alliance is likely to be a model for others seeking platform and procurement scale but unwilling to risk the challenges of full integration.

Figure 8: 77 percent of global production is concentrated among 10 companies¹⁶

| Rank | OEM group | HQ location | 2008 global production | Global market share | Cum. market share |
|------|----------------|-----------------------|------------------------|---------------------|-------------------|
| 1 | Toyota | Japan | 9,237,780 | 13.3% | 13.3% |
| 2 | GM | United States | 8,282,803 | 11.9% | 25.2% |
| 3 | Volkswagen | European Union | 6,437,414 | 9.3% | 34.4% |
| 4 | Nissan-Renault | Japan/ European Union | 5,812,416 | 8.4% | 42.8% |
| 5 | Ford | United States | 5,407,000 | 7.8% | 50.6% |
| 6 | Fiat-Chrysler | European Union | 4,417,393 | 6.4% | 56.9% |
| 7 | Hyundai-Kia | Korea | 4,126,411 | 5.9% | 62.9% |
| 8 | Honda | Japan | 3,912,700 | 5.6% | 68.5% |
| 9 | PSA | European Union | 3,325,407 | 4.8% | 73.3% |
| 10 | Suzuki | Japan | 2,623,567 | 3.8% | 77.0% |

Source: International Organization of Motor Vehicle Manufacturers

Figure 9: The dominant groups (>1 million units) will be headquartered in six major markets¹⁷

| HQ location | OEM and current HQ | | Potential 2020 HQ |
|----------------|--|-----|-------------------|
| European Union | VW, Renault-Nissan (0.5), Fiat-Chrysler, PSA, Daimler, BMW | 5.5 | 3.5–4 |
| United States | GM, Ford | 2 | 1.5–2 |
| Japan | Toyota, Nissan-Renault (0.5), Honda, Suzuki, Mazda, Mitsubishi | 5.5 | 2.5–3 |
| China | | 0 | 1.5–2 |
| India | | 0 | 0.5–1 |
| Korea | Hyundai-Kia | 1 | 0.5–1 |

Source: Deloitte Touche Tohmatsu analysis. August 2009



“China is closer to having product for mature markets than most think.”

— Matt O’Leary
Director, Corporate Strategy, Ford Motor Company

Supplier networks in low-cost centers

As OEMs and suppliers move to regional models for both low-cost production and design, they will need to examine production quality and maturity in the low cost regions and then choose from the following supplier strategies:

1. Move existing suppliers, along with the OEM, to set up regional low-cost facilities.
2. Identify companies in the local marketplace to replace existing suppliers (but only when local markets display sufficient maturity).
3. Encourage established suppliers to partner with local companies (through joint ventures or other mechanisms) to combine technology know-how with local, low-cost manufacturing.

Developing these supplier networks will be one of the greatest challenges OEMs will face over the next ten years. Existing suppliers are strained and often lack the financial muscle to add new manufacturing capacity in new markets. Suppliers are also sensitive to technology transfer to local third parties, rightly fearing the creation of new, lower-cost competitors.

Because of this, and the need to move quickly to capture growing markets, Ravi Sud, CFO of Hero Group, believes that increased collaboration among suppliers is inevitable. “Manufacturers need to be able to cater to ever-changing customer demands in the shortest possible time. They need to gain access to technology faster and ensure the technology is launched faster.”¹⁸

Dr. Jerome Guillen, Director, Business Innovation, and Dr. Frank Spennemann, Senior Manager, Business Innovation at Daimler AG suggest that, “the emergence of new major global suppliers in traditional commodities is doubtful due to the strong technological foundations of existing players, as well as the degree of investment required to become established in developed markets – at the same time, there will certainly also be chances for smaller, highly innovative pioneers who are able to respond rapidly to emerging demands in new technologies.”¹⁹ Ford’s Matt O’Leary, Director, Corporate Strategy, also says that “technology will come from non-traditional places. Alliances will be broader than what the auto industry has had in the past.”²⁰ OEMs will need to adopt a mix of supplier strategies to ensure the availability of the necessary components, quality, and technologies as they expand their operations in emerging markets.

Higher volume global architecture will become the norm

A common challenge for automakers is the inefficiently low volume of units produced per platform. To remain cost competitive, OEMs have started to reduce the number of platforms they produce and are achieving much greater diversity of models produced from each platform (see Figure 10). Honda, with its flexible common platform, developed three dimensionally-distinct versions of the Accord, allowing for market-unique designs where 60 percent of the components are common. And Ford CFO Lewis Booth reports that the company aims to build 680,000 vehicles per core global platform within five years, up from current levels of 345,000 units.²¹

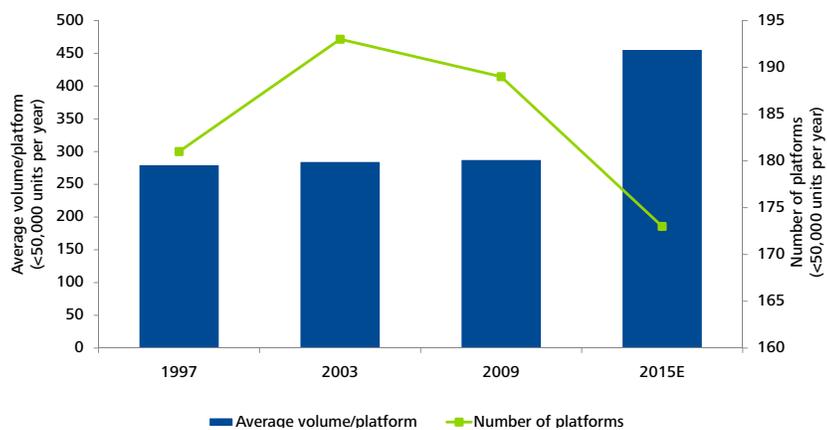
To remain competitive and maintain centralized quality controls in rapidly-growing emerging markets, regional design centers will have to be globally networked. Examples of this emerging trend include Renault, which established a design studio in Mumbai to create vehicles for India; PSA Peugeot Citroen which maintains a technical and styling center in Shanghai; and Daimler with one center in Pune, India and plans for a Benz design center in Beijing.²²

Figure 10: The importance of global platform architectures has increased significantly²³

| 2003 Top five global platform volumes (Million units produced) | | 2007 Top five global platform volumes (Million units produced) | |
|---|-------------|---|-------------|
| GM T800 (Silverado, Tahoe, Escalade, etc.) | 1.67 | VW A5 (Golf, Passat, A3, TT, etc.) | 2.58 |
| VW PQ35 (Golf, Bora, Beetle, A3, etc.) | 1.42 | Toyota MC (Camry, Avalon, ES) | 1.87 |
| Toyota NCV (Corolla) | 1.31 | Renault/Nissan X85/B (Clio, Micra, Logan) | 1.86 |
| Honda CYR (Accord, Odyssey) | 1.18 | Ford C1/P1 (Focus, 3 & 5, S40, V50, C70) | 1.66 |
| Toyota TMP (Camry) | 1.08 | Toyota NBC (Vitz/Yaris, Ayao, etc.) | 1.53 |
| Total 2003 top five | 6.66 | Total 2007 top five | 9.50 |

Source: Automotive news, Data center

Figure 11 – Increase in global platform volumes²⁴

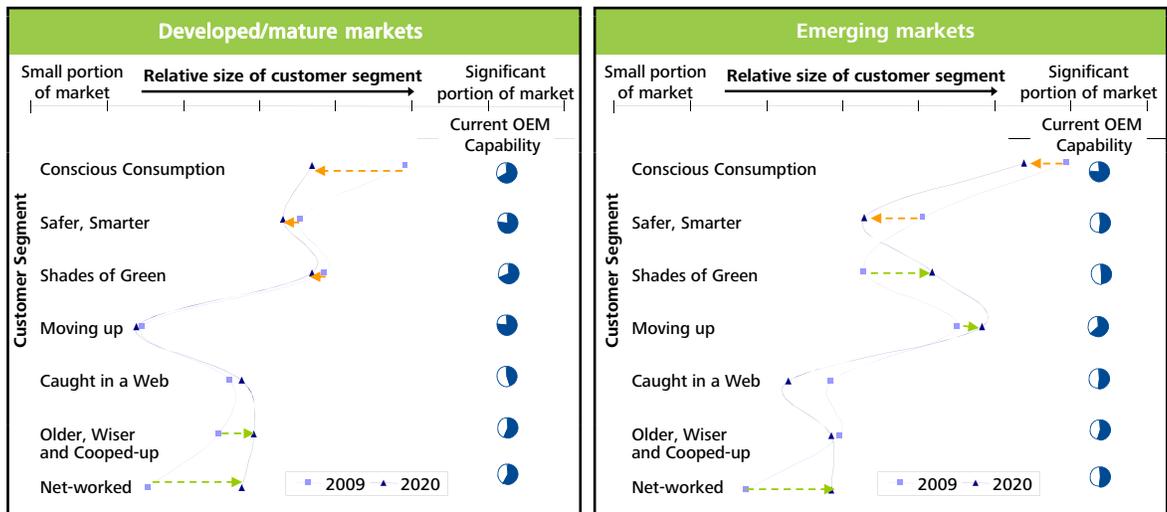


Source: CSM Worldwide

Changing customers, changing demands

Over the next ten years, the automotive industry will likely see the most dramatic changes in customer buying preferences in its 100-year history. Profound in their nature and implications, these changes will play out differently according to the dichotomy between mature and emerging markets. Customers will fragment into distinctly different segments by 2020. Attitudes altered by the recession will continue to evolve in mature markets, while a shift from economy cars to luxury segments will occur in emerging markets. Advancements in alternative technologies will also transform consumer mobility. OEMs will struggle to make required investments and develop the capabilities to deal with these trends. The winners will be the ones that profitably and flexibly meet regional customer requirements.

Figure 12: Projected customer segment shifts by 2020²⁵



Source: 2009 Deloitte Internal Automotive Survey (United States, European Union, Japan, China, Russia, Brazil, Mexico, and India).
Deloitte Consulting LLP

The customer dichotomy

Segmentation of customers is nothing new to marketers in the automotive space. However, by 2020, the fragmentation of customer needs across the world means that automakers will have to pay more attention to regional demand.

Global OEMs must grapple with the reality that customer demand in both mature and emerging economies is changing, albeit vastly different ways (see Figure 12). By 2020, consumers in emerging markets will move beyond basic vehicles to embrace luxury vehicles and green technologies. While in mature markets, as the global recession fades,

consumers will demand that their vehicles are connected to their computers, mobile phones, work and homes.

These customer trends create tremendous economic challenges for OEMs. In 2009, customers show little willingness to pay extra for entertainment features and green technologies. Meanwhile, the cost to develop and manufacture these technologies remains stubbornly high. The winning OEMs will be able to leverage their brands and marketing to stimulate consumer demand for these features while achieving manufacturing efficiencies that result in sustainable profits.

Seven major global customer trends to watch

In both developed and emerging markets, OEMs and suppliers should be conscious of the following trends in order to take advantage of the most important opportunities emerging towards 2020:

1. Conscious consumption – a growing emphasis on value

“Economic crises imbed themselves in the memories of those who live through them”, says Matt O’Leary of Ford. “The global recession will have a lasting impression on consumer behavior.”²⁶ Even as prosperity returns, the value of money takes on new meaning. As such, the current economic crisis will leave more value-oriented car customers in its wake. In fact, a recent Deloitte Consulting LLP survey indicated there will be a significant shift of purchase priorities.²⁷ Value and safety will become the most important features. As a result, smaller car models with enhanced safety features will enjoy stronger sales leading up to 2020. Short-term trends support this thesis: most participants in the United States’ ‘cash for clunkers’ program have exchanged SUVs and small trucks for smaller cars.²⁸

In emerging markets, car ownership is becoming more widespread, and yet the gap between car ownership in major markets such as Brazil, Russia, China, India, and the developed world remains significant. In the United Kingdom, for example, there are 511 cars on the road for every 1,000 citizens. But in high-growth China there are only 22 per 1,000, while in equally booming India, there are only 11 per 1,000 (see Figure 13).

Car ownership in the developing world is set to rise. The largest purchasing segment by 2020 will be those customers buying a car for the first time.²⁹ They, too, are expected to be value conscious.

India provides a telling example. “India will have a growing set of young people who will need transportation solutions,” says RC Barghava, Chairman of Maruti Suzuki India. “The needs of these young people are the most critical and OEMs will have to fine-tune their portfolio accordingly”.

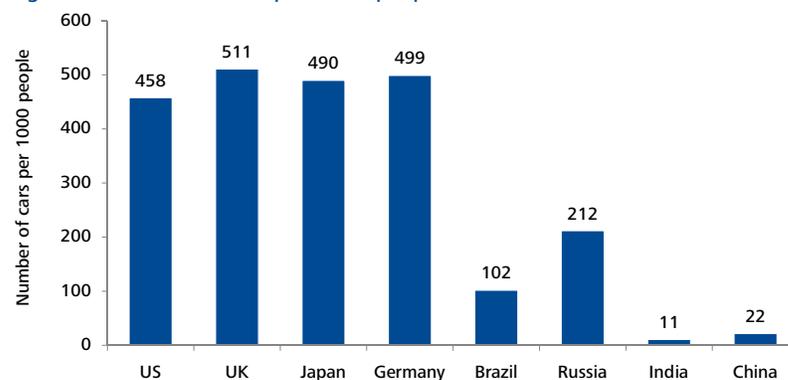
That said, as in the developed world, cost will not be the only consideration. The expectations of first-time buyers in developing markets will likely increase rapidly. Value-oriented models will need to offer safety and technology features commonly associated with today’s premium brands.

A variation of this value-perception phenomenon is being seen in China, says Ford’s Matt O’Leary. “In the interior of the country, there has been movement from motorcycles to small cars but price remains the most important factor. But individuals in coastal areas are willing to spend money on the latest and greatest and on a global product. They see themselves as part of the global market.”³⁰

2. Moving up — the emergence of new wealth in emerging markets

The growth of the middle class (and subsequent jump in the number of high-net-worth individuals) in the developing world has been staggering and creates new opportunities for luxury brands whose demand in the developed world is in decline. A recent Deloitte Consulting LLP survey indicated the upper end of the customer base, those individuals with high levels of disposable income, will seek luxury brands with performance features as well as luxury add-ons, such as leather seats, sunroofs, and heated seats.³¹

Figure 13: Number of cars per 1,000 people – 2008³²



Source: “Automotive Industry Briefing”. Economist Intelligence Unit

“In India the majority of people want vehicles to commute. They are customers who look for utility.”

— Ravi Sud, CFO, Hero Group

The market for luxury cars in the developing world might best be compared with the explosion in demand for high-end brands in the late 1990s and early 2000s in North America and Europe. OEMs with strong luxury car portfolios can take advantage of this growing segment by establishing a significant global brand presence and catering to regional needs. But there is a challenge. The current practice of developing specific luxury models for specific markets may no longer be economically feasible and, as discussed above, the development and marketing of luxury models will need to use global platforms to reduce overall expenses and maximize platform volume. This may undermine the exclusivity of certain brands and diminish their perceived value.

3. Shades of green — cost vs. consciousness

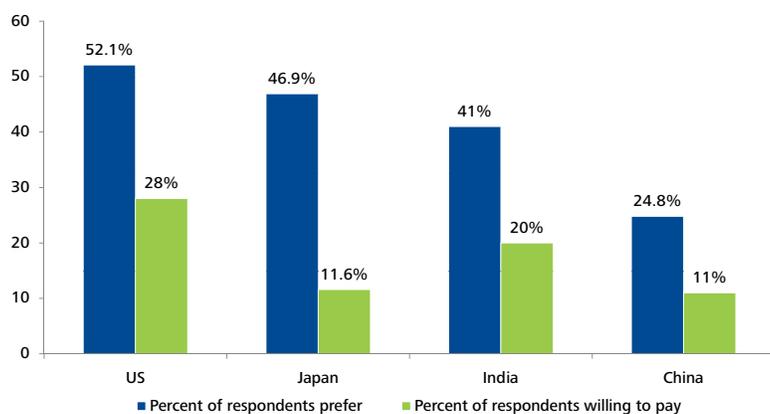
Higher fuel prices and concerns over global warming have focused attention on cars that either rely less on traditional fossil fuels or use renewable sources of less expensive energy. But there is a notable discrepancy in the perception of the value of these cars.³³ While a majority of U.S. drivers (52 percent) claim a preference for alternative fuel vehicles, only 28 percent would be willing to pay a premium. In India, even fewer respondents (20 percent) were interested in paying an upfront premium for cheaper long-term fuel costs (see Figure 14).³⁴

Most customers, it seems, do not feel that the savings at the pump are sufficient to offset the higher price of today’s alternatively fueled car. This will prove especially true among first-time car buyers in emerging markets who will always be sensitive to purchase price and lifetime costs.

The challenge for OEMs is to achieve manufacturing efficiencies with alternative powertrain by bringing down the cost of batteries. With considerable government support, many companies are pouring resources into researching this issue. The OEM that develops a battery that is either cheaper or powerful enough to get the customer to pay a premium will find itself with a technology that may become the standard and that OEM will enjoy all the corresponding advantages of being the first mover.

In emerging, high-growth markets, consumer preference for green vehicles is shaped by local environmental issues and government policy, as well as relative costs of different fuel options. For example, Brazil’s enthusiastic adoption of flex fuel is a direct result of a government initiative to relieve the country of its reliance on petroleum imports. A BMW China senior executive points to an acquisition tax cut on vehicles with engines smaller than 1.6 liters that spurred growth in sales of small-engine cars.³⁵

Figure 14: Alternate fuel – preferences vs. willingness to pay³⁶



Source: 2009 Deloitte Automotive Survey. Deloitte Consulting LLP

4. Safety first – consumers to be attentive to innovations

As technologies evolve, safety remains a primary customer need across all markets. Indeed, a 2008 Consumer Reports survey on car brand perception found that U.S. car buyers view safety and quality as the most important considerations to their final purchase decision.³⁷ In India, while price and fuel economy are most important, safety falls right behind.³⁸ It comes as no surprise, then, that consumers surveyed in both the U.S. and India indicated a willingness to pay a premium for features and options such as skid control, telematics, safety devices, and blind spot mirrors. By comparison, the least-valued features are conveniences not associated with safety, such as power lift gates, soft close, or cap-less fuel door systems (see Figure 15).

Consumer interest in safety has prompted government involvement. In the U.S., for example, the National Highway Traffic Safety Administration has introduced a proposal to mandate Electronic Stability Control on all passenger vehicles by the 2012 model year.³⁹

To meet increasing consumer demand for safety, OEMs will need to focus on developing and providing safety-related features. This will present several challenges to engineers as they try to improve crash safety standards while meeting the need for cheaper, more efficient cars (e.g., smaller and lighter) among value-conscious drivers. These consumers will reward car makers who make best use of advanced materials and innovative design.

5. Staying connected — the need to be networked

Safety is also an important consideration when it comes to choosing electronic options that enable the driver to keep in touch. Features like automatic crash notification, emergency assistance, and remote vehicle diagnostics spurred strong interest among customers surveyed.⁴⁰ Of course, being connected offers several other benefits in addition to safety.

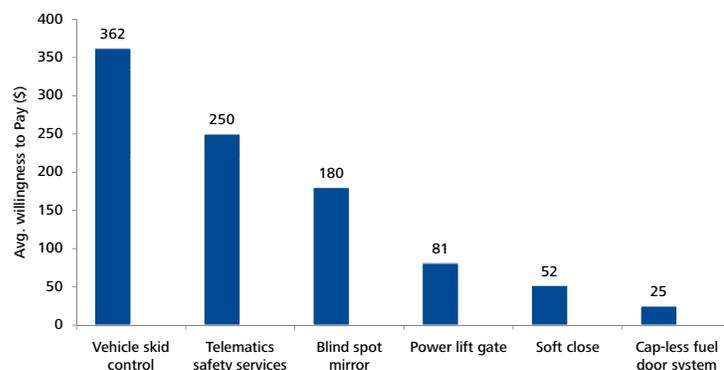
Consumers also professed interest in features that:

- Reduce distractions (via hands-free calling and access to managed content⁴¹)
- Improve navigation (through GPS and traffic updates)
- Enhance entertainment (with satellite radio, MP3 connections, and access to digital music)

Because of these tendencies, as the economy improves over the next two to three years, an increase in demand for safety-related connectivity will likely be seen across all global markets. OEMs must realize that vehicles exist within an evolving technology ecosystem, one that extends beyond the traditional car. In a decade's time, for example, the cell phone may contain many of the same navigation, communication, and tracking features currently being developed for automobile use. iPod and MP3 player connectivity are already common features. The car will have to interface with other tools to keep pace with (and leverage) the fast moving consumer electronics industry.⁴²

The number of potential options is dizzying and OEMs will find themselves in the difficult position of having to bet on some at the expense of others. Unfortunately, their ability to bet right will be compromised by the fact that these components increasingly belong to the high-tech industry and

Figure 15: Customer willingness to pay for technology⁴³



Source: 2009 Deloitte Automotive Survey. Deloitte Consulting LLP

“To be successful, car marketers must use the internet to develop virtual showrooms that can be easily navigated by customers.”

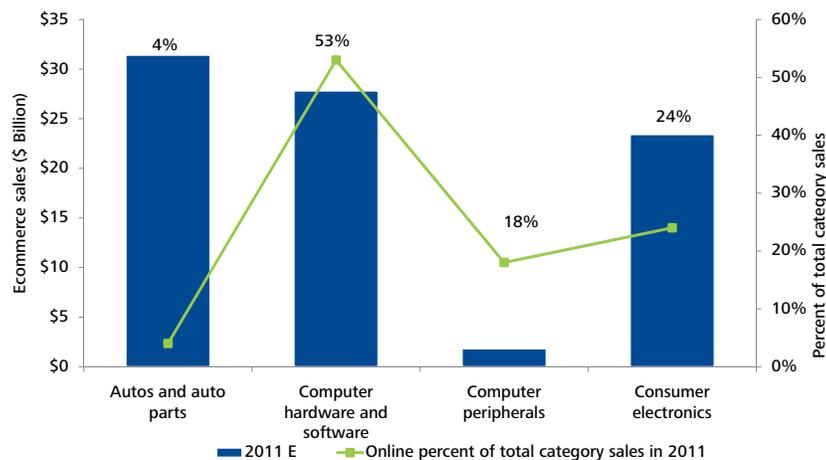
— RC Bhargava,
Chairman, Maruti Suzuki India

not among the core competencies of automakers. To lessen the chance of getting it wrong, it will be essential for OEMs to work with players in high tech to combine their expertise and develop the features customers are willing to pay for.

6. The web – mixed reviews for internet as a sales channel

More and more customers are turning to the internet to purchase cars. The past five years have seen a steady increase in sales volume, with a compound annual growth rate of 14.6 percent in the United States and 20.1 percent in Western Europe.⁴⁴ As a percentage of total sales, however, more individuals still prefer to see, touch, and test drive their car before buying. Only 4 percent of total car sales in the United States take place online (see Figure 16).⁴⁵

Figure 16: Online buying as a percent of total sales in the United States⁴⁸



Source: Forrester, Forecast: U.S. and U.K. online retail sales by category, 2006 to 2011

While the need to test drive is the major barrier to growing online sales, customers are also hampered by:

- An inability to access accurate and complete product and pricing information online
- Unsuitable interface to negotiate on pricing with dealers
- Concerns about delivery
- Lack of integration with related services, such as financing and insurance
- Low connectivity rates and internet access in emerging markets

Additionally, in many markets dealers wield considerable economic and political clout. In the United States, for example, state franchise laws restrict direct OEM sales.

These factors will hamper OEM efforts to increase online sales, and as a result, large-scale adoption of the internet as a sales channel is unlikely, and companies will continue to rely on dealerships as their primary sales channels.

But OEMs are clearly still attracted to growing the internet sales channel. General Motors and eBay recently launched a test program in California that will allow consumers to negotiate with dealers to buy vehicles online.⁴⁶

Another source of hope for online sales resides in emerging markets such as India and Brazil, where the commoditization of vehicles at the entry-level will reduce the need to compare and contrast or negotiate with a dealer over options and price. But companies should not neglect the web as a sales tool. “Parts and after sale service purchases are already strong online and will continue to grow,” says Daimler’s Jerome Guillen, Director, Business Innovation.⁴⁷

7. Changing preferences — older, more urban consumers

As the median age of the populations of Japan, Western Europe, the United States, and Russia creeps upward, car makers will need to address the changing priorities of older drivers in order to



gain and retain their business. A recent Deloitte Consulting LLP survey showed that the mature demographic segment in the United States value quality, price, and safety above fuel economy, styling, brand, and even the warranty (see Figure 17).⁴⁹ In Japan and Russia, ergonomic features have been cited as a selling point for the same segment.⁵⁰

To reach the mature driver, OEMs will need to focus on the development of user-friendly, intuitive, low-cost vehicles. Vehicles targeted for the older driver will need to be designed with human factors in mind: Easier vehicle entrance and exit, larger displays, improved lighting, and augmented night driving. With features designed to augment safety and reliability, these cars will improve the ownership experience compared with current low-cost options.

The other important demographic trend is urbanization. Around the world, cities are experiencing strong population growth. In developed countries, the proportion of the population living in urban centers is currently 75 percent, while in the developing world urban dwellers represent 45 percent of the population. However, by 2020, those numbers are expected to rise to 78 percent and 55 percent, respectively. By that same year, there will be 24 megacities with populations of at least 10 million.⁵¹

Since improvements in infrastructure usually lag population growth, increasing urbanization will make city streets more congested, noisy, and polluted. Commute times will lengthen. Those who continue to drive in cities will look for smaller, more fuel-efficient vehicles. But as congestion increases, many customers will abandon car ownership (or leasing) in favor of public transit. Even in these cities, however, consumers will need periodic access to vehicles for trips to outlying areas and other special occasions.

Where public transit is inadequate, a car will still be the preferred day-to-day option. In many Latin American cities, for example, public transportation is

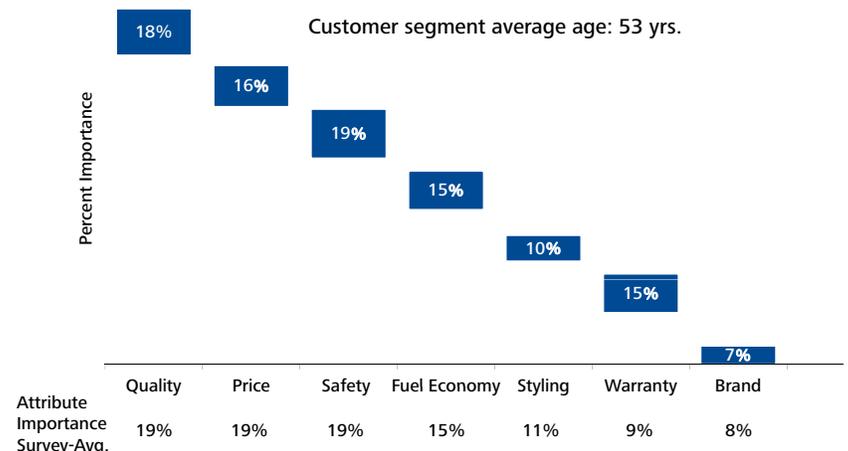
poor enough that people who currently own cars are unlikely to abandon them. In these markets, 70 to 80 percent of vehicles on the road are small and this is not expected to change over the next decade.⁵²

OEMs will need to evaluate alternate models of mobility and rethink typical vehicle packaging, proportions, and use options for their urban customers. Different markets will need alternatives to the traditional single-owner model. Smart, flexible, user-friendly rental options, such as Daimler’s Car2Go in Germany (launched in 2008)⁵³ and Zipcar in North America,⁵⁴ will have to be considered.

“Parts and after sale service purchases are already strong online and will continue to grow.”

— Dr. Jerome Guillen, Director, Business Innovation, Daimler

Figure 17: Attribute preference for the “mature” customer⁵⁵



Source: 2009 Deloitte Automotive Survey. Deloitte Consulting LLP



Technology to reflect new sets of demands

Consumer demands and new regulations will heavily influence the development and marketability of innovations in the auto industry. First among these demands is fuel efficiency, which will lead to new (or improved) powertrain technology. But safety and infotainment are also important consumer considerations. The approach to technology will differ between developed and emerging markets. Advanced combustion engines will extend the reign of combustion engines over alternative technologies.

The approach to technology content in cars will be divided on regional lines. Green alternatives, such as electric cars will likely find more consumer interest in wealthier countries while flex-fuels, such as ethanol and natural gas will find wider adoption in emerging markets where the local climate or resource base favors these fuels over petroleum.

The outcome will be a variety of powertrain technologies in the market by 2020. Government policies will heavily dictate the portfolio mix in each country. These policies will be driven by a number of factors from stricter carbon emission standards to independence from foreign energy.

Deloitte member firms estimate that by 2020, electric vehicles and other “green” cars will represent up to a third of total global sales in developed markets and up to 20 percent in urban areas of emerging markets.

Industry players need to be aware of the following trends in order to take advantage of the most important opportunities emerging among car buyers around the world. These trends include:

1. Powertrain technology and the move to electric
2. The shift from mechanics to electronics
3. Low tech mobility

1. Powertrain technology and the move to electric

Currently, hybrids and electric vehicles (EVs) represent a tiny fraction of total cars on the road. In Germany, of the 49.6 million cars⁵⁶ in operation, a mere 1,500 are electric while 22,300 run on hybrid technology.⁵⁷ Yet growing environmental concerns among consumers⁵⁸, environmental regulation, volatility of gas prices, and depletion of oil reserves⁵⁹ will translate into a moderate increase in demand for EVs by 2020, especially for use in short commutes.

With large-scale production of EVs set to begin in Europe in 2011⁶⁰, the growth potential in Europe should not be ignored. Although the number of EVs on the road will remain low at first, surveys suggest that Europeans are willing to switch to EVs.⁶¹

Barriers to widespread adoption of EVs

Between now and 2020, there are several potential barriers to the wider adoption of EVs:

- Elevated costs of electrically propelled vehicles
- Limited range of EVs
- Lack of infrastructure
- Lack of government incentives or subsidies

Currently, electric vehicles are significantly more expensive compared to traditionally propelled vehicles. This is due mainly to the costs of the lithium-ion battery, which adds €10-€15,000 to the price of a traditional internal combustion vehicle.⁶² Also, specialized microprocessor controls for the electric motor and the need to adapt systems such as air conditioning (which usually draw power from the combustion engine) increase development cost of EVs as well as the end customer price.⁶³ Better Place tries to answer this problem with a lease model for an EV's battery pack: The battery pack will remain the property of the company and customers are charged a monthly fee. However, the future for this model is highly uncertain.⁶⁴

Another significant barrier to the adoption of EVs lies in the very limited reach of EVs compared with traditionally propelled vehicles. The electric vehicles of the first generation, which will be launched over the next two years, come with a range of less than 200km. That means that consumers would need to alter their usage behavior dramatically. Instead of refueling their ICE propelled vehicle as needed in 5-10 minutes, drivers of EVs would likely plug-in their vehicle every night to top off the charge.⁶⁵

The limited range of lithium batteries creates the need for thousands of recharging stations placed along highways, throughout cities, and in parking garages. Better Place is currently building infrastructure,⁶⁶ but much more needs to be done before drivers will trust driving their EVs over longer distances. Moreover, initiatives to standardize batteries and connector plugs have yet to emerge.

Because of this, as well as increased urbanization and higher maintenance costs, a senior executive at FAW-Volkswagen in China believes that "small electric vehicles will develop only for short distance driving. These cars will be used in conjunction with city buses and railways."⁶⁷

Government incentives to spur EV adoption are also lagging. Although governments in the United States and Western Europe support the development of EV technology⁶⁸, only France, England, and China offer subsidies (up to €5,000 or US\$7,100) on EVs.⁶⁹ In Germany, the government offers a car tax exemption⁷⁰ to EV buyers rather than a cash subsidy, although with the yearly tax burden for owning a Volkswagen Golf set at €124, the incentives are hardly overwhelming. That said, whether through tax measures, subsidies, or regulatory reform, government can still play an enormous role in the spread of EVs, according to Daimler's Dr. Jerome Guillen, Director, Business Innovation, and Dr. Frank Spennemann, Senior Manager, Business Innovation.⁷¹

Some municipalities are taking steps to build infrastructure. In Stockholm and Amsterdam, for example, recharging stations are already in operation. In Germany, larger utilities (RWE and EON) are building infrastructure while in Canada, the City of Vancouver recently voted to expand electrical vehicle usability by requiring developers to put electric-car plug-ins in a percentage of new condominiums and apartments.⁷² Companies are also preparing. In October 2009, Daimler will loan the City of Berlin a fleet of 200 EVs for testing purposes.⁷³

Finally, the ascent of EVs in developed markets is likely to be threatened by the emergence of alternative fuel technologies, as discussed below. If research and development (R&D) efforts are able to reduce the "well-to-wheel" efficiency of advanced technology and biofuel combustion engines significantly below 120g CO₂/km⁷⁴, mass market adoption of electric vehicles may be delayed due to increased customer acceptance of the existing technology.



Internal combustion engines to dominate in emerging markets

In emerging markets, new car sales will likely be overwhelmingly dominated by traditional, internal combustion engines. One reason is the price of fuel. Fuel taxes make for significantly more expensive gasoline in Japan and Europe, in some cases more than double the price of fuel in developing markets.⁷⁵

However, there is considerable interest in reducing pollution in the megacities of China and India and where price is not the only factor, demand will vary based on largely political and geographical factors, says a senior executive at Hyundai China. “Driven by pressures on energy saving and emission reduction, developed countries will proceed with the adoption at a relatively high pace”.⁷⁶

The impetus to go electric as a means to reduce carbon emissions is less acutely felt in China and India, where aggregate carbon emissions from automobiles are miniscule when compared with emissions from coal-fired power plants.⁷⁷ But, the Chinese governments’ push to be one of the leading producers of hybrid and all-electric vehicles within three years may see them leapfrog current technology and strengthen its competitive position.⁷⁸

Other cost barriers include the price of a battery, which is prohibitive for many in the developing

world.⁷⁹ And, similar to those barriers cited for the developed world, emerging markets also lack infrastructure and regulatory support for the widespread adoption of EVs.

Developments in the EV space are widely discussed with several new models recently introduced or planned to be launched in the next few years (see Figure 18). Lower-cost EVs like BYD in China and E-Nano by Tata in India are capturing attention and may be encouraged by governments as a means to counter congestion in larger cities.

The hybrid stepping stone

While consumers await a more EV-friendly world, hybrid vehicles will serve as transition technology in developed and developing markets, according to a senior executive at BMW China.⁸⁰ Hybrids feature lower carbon emissions, greater fuel efficiency, and are less infrastructure intensive than EVs. They also aid in the switch from full-combustion engines to electric motors.

Sales of hybrid cars bear careful scrutiny as they will reveal customer preferences to carmakers. It is expected that by 2020, hybrids will still outnumber EVs but trends point to a fully electric long-term future.

Figure 18: The most talked about electric vehicles⁸¹

| Automaker | Model | Electric power cons. (kwh/100km) | Charging time | Range | Price | Launch date | Comment |
|-----------------|-----------------------------|----------------------------------|---|------------|--|---------------------|--|
| Think Global AS | Think City | | 13hrs | 180km | €20-25 k | 2007 | |
| Tesla | Roadster | 14 | 3.5hrs | 350km | €75 k | 2008 | |
| Mitsubishi | i-Miev | | Quick-charge: 80 percent in 30 minutes; household charger (200V): 100 percent in ca. 7hrs | 160km | €35 k (will be skimmed along production volume; target price: €15k) | 2009 | |
| Subaru | Plug-In Stella | | Quick-charge: 80 percent in 15 mins; household charger (200V): 5hrs | 80km | €24 k (including a subsidy of €10 k by Next Generation Vehicle Promotion Center) | 2009 | |
| BYD Auto | E6 | 18 | Quick-charge: 50 percent in 10 minutes | > 400km | Pre-sale: 200.000yuan (€20.000) | Second half of 2009 | |
| Nissan | Leaf | | Quick-charge: 30 minutes | 160km | Comparable to a traditionally propelled vehicle* | 2010 | * Battery not included in end-customer price; must be leased |
| GM | Volt | | 10hrs (120V) | 64km | €30 k | 2010 | Range Extender |
| Renault | Kangoo Be Bop Z.E. | | Quick-charge (400V, 64A): 100 percent in 30 minutes; household charger: 4-8hrs | 160km | €21 k | 2011 | |
| Ford | Focus | | | | | 2011 | |
| Toyota | All-electric urban commuter | | | | | 2012 | |
| Tesla | Model S | | Quick-charge: 45 mins | 255-480 km | €50 - 60 k | 2012 | |
| Daimler | Smart EV | | | | | 2012 | |
| Volkswagen | | | | | | 2013 | |
| BMW | Megacity Vehicle | | | | | 2014 | |

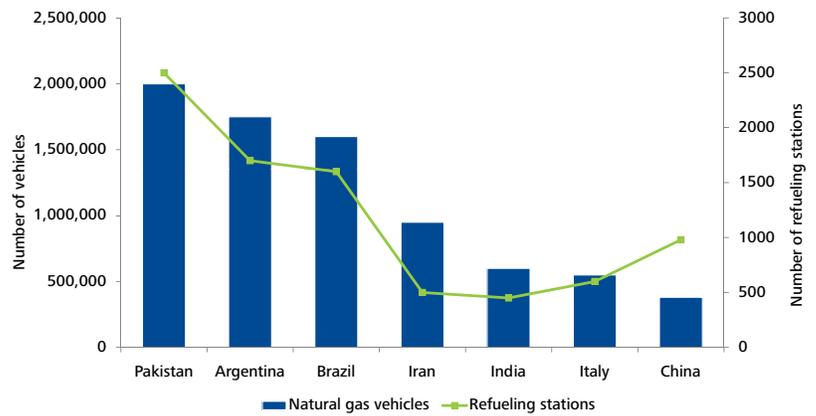
Alternative fuels remain an important option

Of course, while companies rush to produce the most marketable electric vehicles, they will have to keep an eye on developments in the alternative fuel space. In emerging markets in Asia and Latin America, the availability and easy access to natural gas sources is expected to drive adoption of natural gas-powered vehicles (see Figure 19). Further government investments in the necessary infrastructure will be required for natural gas to truly take hold as an alternative. In addition, if the U.S. moves decisively on energy independence, natural gas could become an important part of the domestic fuel portfolio, especially for fleets.

Other means to fuel efficiency

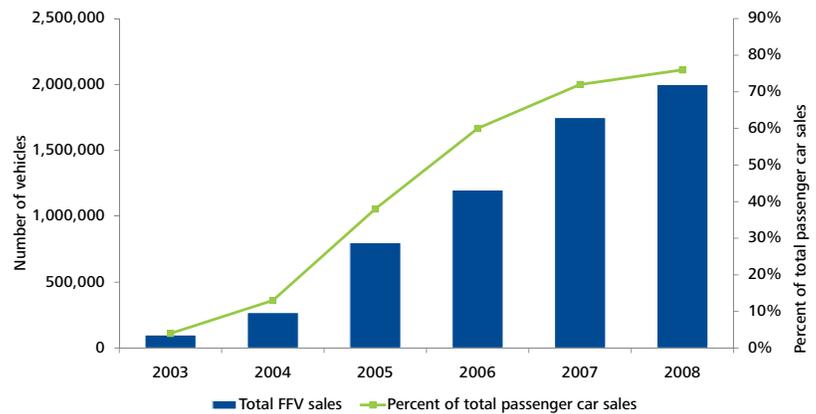
The convincing shift to flex-fuel in Brazil (used by over 70 percent of the cars on the road)⁸² (see Figure 20).^[1] has been spurred by a government initiative to reduce the country's dependency on oil imports. The role of government everywhere is a significant consideration in the development of alternative powertrain technologies. While more efficient technologies are one way, another is to make the cars more efficient by using lighter materials. Matt O'Leary of Ford suggests that "we might be on the tipping point to meet fuel economy constraints" and that "cars may use more aluminum to reduce weight and energy requirements".⁸³

Figure 19: Natural gas vehicle fleet⁸⁴



Source: International Association for Natural Gas Vehicles. 2009 data

Figure 20: Flex-fuel vehicle sales in Brazil⁸⁵



Source: ANFAVEA

2. The shift from mechanics to electronics

The move to greater electronic content in cars has been underway for several years and has been responsible for such major innovations as security systems, anti lock brakes, engine control units, and infotainment. These features proved so enormously popular that they are now widely available, demonstrating that consumers are willing to pay for technology that enhances their driving experience – and also the potential to dramatically reduce costs as volume ramps up. As a result, OEMs have been steadily inserting more electronic components into each vehicle. The German market provides an illustrative example: In 2007, electronic content in passenger cars was estimated at 20 to 30 percent of production costs. By 2010, the proportion is expected to rise to 40 percent⁸⁶ and by 2020, the number will likely reach 50 percent.⁸⁷

3. Low-tech mobility

In emerging markets, while personal income levels are rising, discretionary income remains low. Large segments of the population will not be able to afford full size or even standard compact passenger cars currently offered by European and Japanese OEMs. The cars that will sell best to first-time and lower income buyers in these regions are simply those that are priced most attractively. In some cases, this means stripping a car of any superfluous features.

The launch of the Tata Nano in India is a leading indicator of the rise of the low-content ultra low cost car: It comes without power steering, a single windshield wiper, and a single side-view mirror. The upshot is that OEMs aiming to harvest the strong economic growth forecasted for emerging markets will need to develop low cost, low content vehicles.

More than ever, technology matters

Increasingly, what a car has to offer comes in the form of superior technology. As the number of applications for technology increases, OEMs and suppliers will need to be selective. The criteria for choosing what to include and what to leave out will depend entirely on what customers are willing to pay for. This segmentation is nothing new to car makers, but as the developing world becomes the source of strongest sales growth, the technological features in each car cannot come at the expense of price.

The role of government in directing the industry towards the enduring technologies will be key. In fact, some companies are looking for such direction. “What would help is to have some kind of a policy on national energy security that gets people energized about moving this mountain,” says Ford’s O’Leary. “Anything done around energy security could flow over to the automotive industry and could spur innovation if done right. It could spur us all to a solution mentality.”⁸⁸



“In India, GPS is basically calling the person you are visiting for directions.”

— RC Bhargava,
Chairman, Maruti Suzuki India

Getting the right skills

Key to any lasting transformation in the automotive industry are the primary issues of skills and workforce flexibility. Both OEMs and suppliers will have to plan for a future that requires ever more skilled workers from design to production. In the developed world, an aging population is intensifying the competition for young, talented employees. Successful companies will embrace new and comprehensive approaches to talent management.

Workforce flexibility

The current major transformations taking place in the automotive industry are occurring on a number of fronts, all of which require a flexible workforce. They include:

- **Technology.** The growing demand for greener engine technologies, coupled with a shift towards increased integration of mechanical, electrical, and software engineering.
- **Production.** To reduce risks and costs, OEMs and suppliers are shifting towards the closest low-cost production environments within trading zones.
- **Research and development.** To meet the needs of new customers in emerging markets, companies' R&D and design efforts are being centered in the markets they expect to serve.

Each of these factors will have an impact on talent management as OEMs struggle to find the right numbers of employees with the right skills in the right place at the right time.

To build more technologically advanced cars, workers will need to be suitably trained and cross-trained to handle these new technologies. As production is specialized by region, workforce capability will have to be developed accordingly.

Global programs, regional focus

As technologies evolve, OEMs will endeavor to distinguish and develop talent pools with traditional and non-traditional workers by technology and region. Workforce requirements for each region will be determined by function and scale. Certain functions — such as design, engineering, and parts production — will be carried out on an increasingly diverse geographic basis, working together in a virtual environment. Others, such as assembly, will

be more limited to regional markets. Sales and after sales services, meanwhile, will remain completely focused on the places they operate.

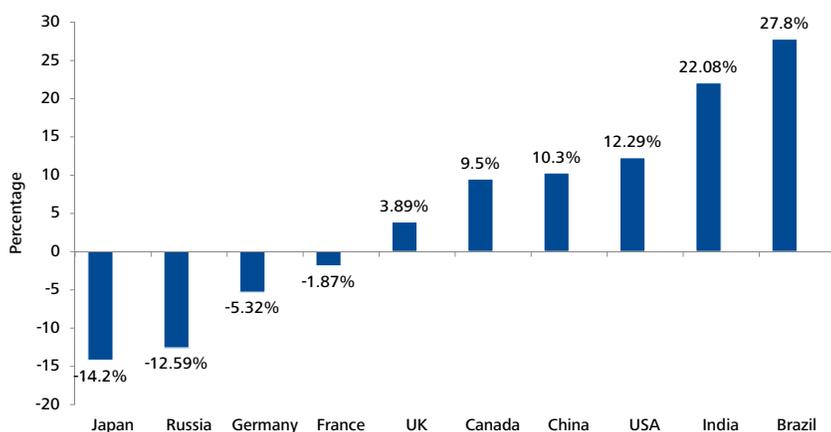
Who will replace the retirees?

Increasingly, skilled workers will leave the workplace due to retirement. Even in the current downturn, many companies are experiencing shortages in certain key areas. For instance, 31 percent of automotive companies in the United States today report moderate-to-severe shortages of skilled production workers, almost all of whom expect the future shortages to be at least as challenging or worse. Similarly, 28 percent of automotive companies report moderate-to-severe shortages of scientists and engineers and also expect future shortages to be at least as challenging or worse. At the same time, having a high-skilled, flexible workforce is seen as one of the top three drivers of future business success.⁸⁹

Plant managers report that while the role for unskilled labor in the developed world is diminishing, rarer skills in project management, computers, communications, and team building are increasingly essential to the success of any production facility. The worker of the future will be expected to handle an enormous array of new vehicle technology and, moreover, keep current with new developments in these technologies. Areas such as the seamless integration of code, engine control units, and the integration of multiple systems are all skill-intensive.

Finding these talented employees in developed markets is hampered by a number of factors. Education is one. Only 16 percent of students graduating from North American universities earn science or engineering degrees.⁹⁰ And despite the

Figure 21: Change in working population (aged 20–64) over 2005–2025⁹⁷



Source: Deloitte Research, based on population division of the Department of Economics Social Affairs of the United Nations Secretariat (2006). World population prospects: The 2004 revision, New York: United Nations

fact that 82 percent of survey respondents consider manufacturing critical to America’s economic prosperity, a recent survey showed that nearly half (49 percent) of all respondents would not recommend a career in the manufacturing sector.⁹¹ Chinese universities, meanwhile, are more oriented to these technical subjects, and 42 percent of all graduates receive their degrees in science or engineering.⁹² That said, while the top Indian and Chinese engineering graduates are very strong, the quality of second-tier graduates may be inconsistent. It is no surprise then, to hear Ajay Seth, CFO at Maruti Suzuki say of the situation in India, “A major issue we are facing in the area of R&D is the lack of good engineering and design capabilities. These critical skill sets are scarce in our region.”⁹³

A senior executive at Volkswagen Group China echoes Seth’s comments that the three most critical areas with skill shortages are R&D, marketing, and management (especially investment management).⁹⁴ The executive also questions the Chinese education system’s ability to keep pace. “Industry is developing rapidly, but the education system is falling behind.”⁹⁵

Ford has encountered similar problems finding the right talent and has partnered with universities to

tailor curriculum. They have set up alliances to create key centers for studying new technology in the auto industries. Importantly, these alliances are worldwide in scope.⁹⁶

Globalization presents another set of challenges related to human resources. A global workforce means different demographic profiles and different sets of expectations across geographies. Coordination of business will involve numerous considerations, including location, language, technologies, regulations, and cultural differences. Each location will have its own skill surpluses and shortages, and coordination of these resources will be a complicated procedure.

At the same time, increasing cost pressures from consumers are placing demands on companies to innovate, which in turn, places a greater imperative on finding the right individuals who can contribute. Yet the recent economic downturn, with its bankruptcies and mass layoffs, has caused many high-talent employees to consider a permanent move out of the industry.

A new approach to labor

The demand for skills does not diminish with a reduction in sales. Markets demand innovation and

creativity and customers demand faster responses to their changing needs. Yet because so much of the cost of producing a car is fixed, the pressure to reduce expenses is frequently focused first on the labor force. The current downturn has forced companies to look at new ways to contain costs and improve margins. However, many companies have reacted too severely, jeopardizing long-term success by not aligning their talent strategies to projected needs. Laid off employees may have taken jobs in other industries and may be unavailable by the time they are once again needed.

In this buyer-oriented market, OEMs and suppliers will attempt to institutionalize flexibility in their labor costs by using nontraditional employees and innovative compensation and scheduling plans.

Two different spectrums exist for OEMs and suppliers to introduce this flexibility:

1. **Core vs. noncore employee mix.** This may include a mix of ad hoc temporary labor to fill the need for strategic capabilities or even outsourced manufacturing. But reducing the number of traditional employees can put the company into crisis when the need to ramp up occurs and there are no workers available. There are cost implications: Severance, replacement, and training among them. And finally, the company's reputation may suffer, making it harder to attract top talent.
2. **Innovative compensation.** To optimize workforce contributions, companies may consider developing customized rewards and compensation programs, such as flexible scheduling, variable compensation, and phased retirement. These solutions can improve cost flexibility, enhance employee satisfaction, and maintain quality and productivity levels without interruption.

Currently, most U.S. companies use ad hoc solutions, but future challenges, uncertainty, and volatility will encourage organizations to institutionalize a dynamic solution.

Investing in long-term skill development

Modern plants need multiple skills to function and currently neither job-related education nor the vocational direction of current students are adequate to meet current or projected needs. In the long run, a failure to find adequately-trained resources and train the current workforce in emerging technologies will significantly hamper manufacturers' competitiveness.

Training begins with pre employment skill development. "The education system will be critical for the development of an employable workforce," says RC Bhargava, Chairman, Maruti Suzuki India. "The current education system in India, for example, is not geared to meet the workforce requirements for an economy growing at an annual rate of nine percent."⁹⁸

Once employees are in the plant, progressive companies will provide training on a proactive and ongoing basis. There are calls for more group-based training as teams become more responsible for improving products and processes, working business plans, and addressing performance gaps. In short, the employee of the future will have a broader set of skills, rather than narrow capabilities, that make him inflexible.

Training programs will be adjusted based on generation and job type, each of which has different learning styles. For example, Generation Y prefers interactive learning from trusted sources, using short videos, simulation, and practice to quickly master skills.

Improving the industry's employment brand

Generation Y will form the largest portion of the future working population⁹⁹ and will arrive on the job with a unique set of needs and expectations. This is not great news for the automotive industry. The auto sector is perceived negatively today among Gen Y in western countries and Japan. Industry jobs are seen as low paying, physically intensive, dirty, and unsafe. Gen Y also lacks confidence in the future of manufacturing.

What's more, growth in other industries where similar skills are needed (e.g., software development, business process outsourcing, and other service sectors), is raising the competition for young, talented people.

OEMs and suppliers will need to work on their brand image to break down negative perceptions. They may consider open houses, chamber of commerce meetings, or field trips that invite students and parents to tour their plant where they can learn more about the industry and the numerous challenging and rewarding career opportunities. They may further engage the community by speaking with local leaders about the economic value of job creation and the retention of skilled workers to the community.

OEMs will all need to consider the expectations of this young new workforce. They want a sense of purpose and meaning to their work, a tech-savvy work environment, work/life flexibility, and long-term career development. To strengthen their case, OEMs will need to experiment with recruiting programs, internships, and cooperative employment arrangements. Advertising or public relations campaigns will also be employed to transform the employment image.

This is not only the case in North America. At Hyundai China, executives have identified the need to "cultivate a base for competition, innovation, and learning, to press employees towards improving themselves."¹⁰⁰

One of the best sources of feedback on the industry's employment brand is the customer. Research from customer surveys will be leveraged by progressive companies to help direct programs aimed at enhancing the brand among Gen Y. The same intelligence will be used to launch a wider advertising campaign to emphasize those characteristics this demographic deems important.

Align, analyze, and differentiate

OEMs and suppliers will endeavor to create a more explicit connection between business and talent strategies based on a fact-based understanding of talent supply and demand, not only in the external market, but also within the company. Armed with this knowledge, a mix of talent and work solutions will be crafted to drive competitive advantage.

Workforce planning will emphasize workforce training to enable a flexible, diverse, and global workforce to ensure that engineers and managers are equipped with emerging skills and to transition production workers into skilled trades' positions.

Increasingly, programs will be tailored to offer special attention to critical workforce segments with explicit metrics for design and evaluation. These metrics will be reviewed at the board level and the onus will fall on the human resources function to include organization, process, technology, and vendors in their spheres of activity.



The next chapter in industry history

Over the next decade, the automotive industry as a whole will experience dramatic transformation. The economic crisis has acted as an accelerant, placing pressure on many companies to change.

Consolidations will leave the industry with fewer global players. Those that remain will look to shift substantial engineering and production to lower cost centers. This move will not only help contain costs (principally, variable labor costs), but it also means that automakers will be able to access valuable talent and respond more easily to the demands of the fastest growing segment of car buyers in emerging markets.

In emerging markets, an entirely new class of car buyers will seek low-cost, low-tech cars, while a significant segment of newly wealthy customers will want more luxurious brands. In the developed world, the priorities of drivers will shift away from fashionable add-ons to features designed to enhance the safety and efficiency of their vehicles.

But the most important factor will remain price, and carmakers developing greener engines will need to find ways to make these cars price compatible with more traditional internal combustion engines. Other new technologies, those that enhance safety,

efficiency, and connectivity, will also be important to developed world customers.

To guide these transformations, automotive companies will struggle to find the right people, with the right mix of skills, at the right time, at the right cost. Their approach to talent must be proactive and progressive. A fundamental shift in people management practices will be undertaken to differentiate the automotive industry, and enable companies to attract, retain, and motivate the talent needed for future business success.

Understanding these four elements — structure, customers, technology, and people — and how each will evolve over the next decade is key for both OEMs and suppliers. The transformations implied will touch on every step of the complex process involved in taking a car from a designer's imagination to a customer's driveway. The companies that thrive in the new emerging competitive landscape will be those that get each step right.



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Endnotes

1. NAFTA light vehicle assembly capacity utilization (Feb 2008 vs. Feb 2009). Ward's Auto, Data Reference Center.
2. Ward's Auto, Data Reference Centre.
3. *ibid.*
4. "CSM Global Light Vehicle Production Summary". CSM Worldwide. July 2009. <http://automotiveforecasting.com/gpo/global-summary.pdf>. "Structural Challenges for the Future. North American Outlook." CSM Worldwide. March 26, 2009.
5. Deloitte interview with RC Bhargava, Chairman, Maruti Suzuki India July 8, 2009.
6. "CSM Global Light Vehicle Production Summary". CSM Worldwide. July 2009.
7. "Structural Challenges for the Future" presentation by Michael Robinet, Vice President, Global Vehicle Forecasts. CSM Worldwide. March 26, 2009. "Auto brain drain". Crain's Detroit Business, May 7, 2007. Primary vehicle development includes vehicle structure, chassis, engine box, build process, powertrain / steering production, safety, seating structure and electronics.
8. Cost of Labor – Economist Intelligence Unit, Data Dictionary, Total Production 2008 – Ward's Automotive Data Reference Centre.
9. "GM, Suzuki to build cars in Hungary". Chicago-Sun Times. January 14, 1990. "Volkswagen to produce new compact sedan in Mexico". Reuters. July 20, 2009. "Nissan Will Shift Production to Mexico to Counter Yen". Bloomberg. February 20, 2009.
10. Renault in Morocco. Renault web site: www.renault.com.
11. Chinese Automotive Policy Guidelines, March 2009.
12. *Ibid.*
13. *Ibid.*
14. Automotive News, Data Center.
15. Ward's Automotive Data Reference Center, China Sales by Company.
16. "2008 World motor vehicle production by manufacturer". International Organization of Motor Vehicle Manufacturers. <http://oica.net/wp-content/uploads/world-ranking-2008.pdf>. Total volumes include cars, light commercial vehicles, heavy commercial vehicles and buses.
17. Deloitte Touche Tohmatsu analysis. August 2009.
18. Deloitte interview with Ravi Sud, CFO, Hero Group, July 7, 2009.
19. Deloitte interview with Dr. Jerome Guillen, Director, Business Innovation, Daimler AG and Dr. Frank Spennemann, Senior Manager, Business Innovation, Daimler AG. July 24, 2009.
20. Deloitte interview with Matt O'Leary, Director, Corporate Strategy, Ford Motor Company, August 4, 2009.
21. "Ford Speeds Up New Product Rollout", AutoBeat Daily, August 7, 2009.
22. "Renault to tie up with design schools in India". The Times of India. February 6, 2008. "PSA opens Shanghai design studio". Automotive News Europe. February 2, 2009. "Daimler India Unit: Mercedes-Benz 2008 Car Sales Up 46% On Yr". Dow Jones. January 9, 2009. "China: Daimler considering an Advanced Design Center in Beijing". Automotive World.com. April 6, 2009.
23. Automotive News, Data Center.
24. "Structural Challenges for the Future", CSM Worldwide, March 2009.
25. Customer preferences based on 2009 Deloitte Internal Automotive Survey (U.S. and India) conducted by Deloitte Consulting LLP. Survey of 991 U.S.-based Deloitte U.S. employees and 2,174 India-based Deloitte U.S. employees. March 2009.
26. Deloitte interview with Matt O'Leary, Director, Corporate Strategy, Ford Motor Company. August 4, 2009.
27. Customer preferences based on 2009 Deloitte Internal Automotive Survey (U.S. and India) conducted by Deloitte Consulting LLP. Survey of 991 U.S.-based Deloitte U.S. employees and 2,174 India-based Deloitte U.S. employees. March 2009. OEM capabilities to meet the 7 customer trends based on discussions with 24 people including executives at major OEMs and Deloitte automotive partners from U.S., UK, Brazil, Russia, China, India, Germany, Sweden, France, Italy, Japan during July 15 to August 10, 2009.
28. "U.S. car buyers prefer smaller vehicles". Financial Times. August 3, 2009.
29. "Automotive Industry Briefing". Economist Intelligence Unit. July 2009.
30. Deloitte interview with Matt O'Leary, Director, Corporate Strategy, Ford Motor Company, August 4, 2009.
31. 2009 Deloitte Internal Automotive Survey (U.S. and India) conducted by Deloitte Consulting LLP. Survey of 991 U.S.-based Deloitte U.S. employees and 2,174 India-based Deloitte U.S. employees. March 2009.
32. "Automotive Industry Briefing". Economist Intelligence Unit. July 2009.
33. Even among 'green' buyers. Toyota's hybrid Prius, priced at a premium to ICE cars in its class sold well. Its unique look also set it apart from other cars on the road. However, customers showed less willingness to pay for other Toyota models with hybrid engines, indicating that it is not only necessary to be green, but to be seen as being green.
34. 2009 Deloitte Internal Automotive Survey (U.S. and India). Survey of 991 U.S.-based Deloitte U.S. employees and 2,174 India-based Deloitte U.S. employees. March 2009.
35. Deloitte interview with a senior executive at BMW China. August 2009.
36. 2009 Deloitte Internal Automotive Survey (U.S. and India) conducted by Deloitte Consulting LLP. Survey of 991 U.S.-based Deloitte U.S. employees and 2,174 India-based Deloitte U.S. employees. March 2009.
37. "Top five in brand perception by category". 2008 Car Brand Perceptions Survey. Consumer Reports. January 2008.
38. 2009 Deloitte Internal Automotive Survey (India) Survey of 2,174 U.S.-based Deloitte India employees during March 2009. Respondents ranged in age from under 25 to over 64 years old, with the majority (87 percent) falling between 25 and 44 years old. Males represented 77% respondents and females 23%. March 2009.
39. "Electronic stability control to be standard by 2012. Government would have safety feature on all light-passenger vehicles". Consumer Reports. August 2009.
40. Deloitte customer survey carried out as part of a client project for a leading Asian automotive OEM in the U.S. during 2009. Deloitte Consulting LLP.
41. Managed content includes intelligent vehicle displays that filter vehicle status to focus on key items and exceptions.
42. Deloitte interview with Dr. Jerome Guillen, Director, Business Innovation, Daimler AG and Dr. Frank Spennemann, Senior Manager, Business Innovation, Daimler AG. July 24, 2009.
43. 2009 Deloitte Internal Automotive Survey (U.S. and India) conducted by Deloitte Consulting LLP. Survey of 991 U.S.-based Deloitte U.S. employees and 2,174 India-based Deloitte U.S. employees. March 2009.
44. Forrester: Forecast: U.S. and UK online retail sales by category, 2006 to 2011.
45. *Ibid.*
46. "General Motors, eBay test selling cars online". Automotive News. August 10, 2009.
47. Deloitte interview with Dr. Jerome Guillen, Director, Business Innovation, Daimler AG and Dr. Frank Spennemann, Senior Manager, Business Innovation, Daimler AG. July 24, 2009.
48. Forrester: Forecast: U.S. and UK online retail sales by category, 2006 to 2011.
49. 2009 Deloitte Internal Automotive Survey (U.S. and India) conducted by Deloitte Consulting LLP. Survey of 991 U.S.-based Deloitte U.S. employees and 2,174 India-based Deloitte U.S. employees. March 2009.

50. Interviews with Deloitte automotive partners in Japan and Russia. July 2009.
51. United Nations, World Population Prospects: The 2008 Revision.
52. Interview with Deloitte automotive partners in Latin America. July 2009.
53. www.car2go.com
54. www.zipcar.com
55. 2009 Deloitte Internal Automotive Survey (U.S. and India) conducted by Deloitte Consulting LLP. Survey of 991 U.S.-based Deloitte U.S. employees and 2,174 India-based Deloitte U.S. employees. March 2009.
56. <http://www.autokiste.de/psg/0903/7847.htm>, Fahrzeugbestand 2009.
57. Frankfurter Allgemeine Zeitung, p. 13. June 22, 2009.
58. Automobilwoche. June 30, 2009.
59. VCO, "Welche Potenziale Elektromobilität wirklich hat". 2009.
60. SZ, "Elektroautos von Renault kommen 2011". June 29, 2009.
61. Stern, "Hoffnungsträger unter Hochspannung". June 30, 2009.
62. "Zeit ist reif für E-Mobilität". TÜV Süd. March 27, 2009.
63. Frankfurter Allgemeine Zeitung. June 22, 2009.
64. "How Volt's cost rose and rose and rose", Automotive News, August 3, 2009.
65. Die Welt, "Renault bringt den Kangoo mit Elektroantrieb", July 1, 2009.
66. Focus Elektroantrieb spielt erst 2020 eine Rolle", June 16, 2009.
67. betterplace.com
68. Deloitte interview with senior executive at FAW-VW, August 2009.
69. "Obama schiebt Öko-Autos an". FT.D. June 24, 2009.
70. "Elektroauto mit Subventionsantrieb". FT.D. July 1, 2009.
71. German motor vehicle tax law §3d.
72. Deloitte interview with Dr. Jerome Guillen, Director, Business Innovation, Daimler AG and Dr. Frank Spennermann, Senior Manager, Business Innovation, Daimler AG. July 24, 2009.
73. "Vancouver gives boost to electric cars". The Globe and Mail. July 12, 2009. <http://www.theglobeandmail.com/news/national/british-columbia/vancouver-gives-boost-to-electric-cars/article1215643/>
74. "Convergence in the Automotive Industry" p. 11. Deloitte (Germany). June 2009.
75. With the current U.S. electric grid, a plug-in hybrid would realize a carbon footprint of approximately 110 g CO₂ / km; Well-To-Wheels Emissions Data For Plug-In Hybrids And Electric Vehicles, Sherry Boschert, 2006.
76. "Gasoline prices around the world in late June". Reuters. July 1, 2009.
77. Deloitte interview with a senior executive at Hyundai China. August 2009.
78. "Electricity Generation by Fuel". International Energy Agency. 2006.
79. "China Vies to Be World's Leader in Electric Cars". New York Times. April 1, 2009.
80. Frankfurter Allgemeine Zeitung, p. 13. June 22, 2009.
81. Deloitte interview with a senior executive at BMW China. August 2009.
82. Various sources: "Toyota to Sell Tiny U.S. 'Urban Commuter' Battery Car by 2012". Bloomberg. January 1, 2009. "Electro-Mobility: the powertrain of tomorrow? www.volkswagenag.de. June 2009. www.teslamotors.com. "Tesla Chairman Says His Company, Daimler to Launch Two Affordable EVs Soon; He Also Says Next-Generation Roadster Will Have Four Seats and Optional AWD". The Green Car Advisor. Edmunds.com. June 2, 2009. "Nissan unveils 'leaf' - the world's first electric car designed for affordability and real-world requirements". Nissan web site. August 2, 2009. "Revealed: 2011 Nissan Leaf Electric Car". Edmunds.com. August 1, 2009. "Renault bringt den Kangoo mit Elektroantrieb". Welt Online. July 1, 2009. "Ford's ready-made electric car". CNN Money. March 20, 2009.
83. "Die Spielregeln ändern sich," Mitsubishi; Handelsblatt, August 2, 2009. "GM shows Chevy plug-in concept". CNN Money. January 8, 2007. "Wenn 10.000 Ingenieure an einem Elektroauto basten". Manager Magazin, July 10, 2009. "Die lange Leitung von BMW". Handelsblatt, August 4, 2009. "FHI to Launch "Subaru Plug-in STELLA" EV in Japan". Fuji Heavy Industries Ltd, press release. June 4, 2009. <http://www.think.no/think/THINK-city>
84. "Alternative Fuels - Lessons from Brazilia" NewCarBuyingGuide.Com
85. Deloitte interview with Matt O'Leary, Director, Corporate Strategy, Ford Motor Company, August 4, 2009.
86. International Association for Natural Gas Vehicles. 2009. <http://www.iangv.org/tools-resources/statistics.html>
87. "Ethanol Flex Light Vehicles Manufacturing in Brazil. 2003 - 2009". Table from "Flexible-fuel vehicle". Wikipedia. http://en.wikipedia.org/wiki/Flexible-fuel_vehicle
88. "Elektronik im Automobil – Segen oder Fluch?". Prof. Dr. Reinhard Reimann, Duale Hochschule Baden-Württemberg Mosbach March 21, 2007.
89. Mikroelektronik-Trendanalyse des Fachverbandes Electronic Components & Systems im Zentralverband Elektrotechnik- und Elektronikindustrie e.V. (ZVEI), 2008.
90. Deloitte interview with Matt O'Leary, Director, Corporate Strategy, Ford Motor Company, August 4, 2009.
91. 2009 People Management Practices Survey in the Manufacturing Industry, conducted jointly by Deloitte Consulting (United States), the Manufacturing Institute, and Oracle.
92. "Higher Education Bachelor's Degrees Conferred per 1,000 Individuals 18–24 Years Old: 2005". National Science Board. January 2008. "Higher Education Bachelor's Degrees in Natural Sciences and Engineering Conferred per 1,000 Individuals 18–24 Years Old: 2005". National Science Board. January 2008.
93. "Managing The Talent Crisis In Global Manufacturing". Deloitte Research. June 2007. The Manufacturing Institute; June 9, 2009.
94. "Editorial: Rethinking science and math education". Dallas Morning News. December 14, 2008.
95. Deloitte interview with Ajay Seth, CFO at Maruti Suzuki July 13, 2009.
96. Deloitte interview with a senior executive at VW China. August 2009.
97. Ibid.
98. Deloitte interview with Matt O'Leary, Director, Corporate Strategy, Ford Motor Company. August 4, 2009.
99. "Managing the Talent Crisis in Global Manufacturing". Deloitte Research. June 2007.
100. Deloitte interview with RC Bhargava, Chairman, Maruti Suzuki India July 8, 2009.
101. "Managing The Talent Crisis In Global Manufacturing". Deloitte Research. June 2007.
102. Deloitte interview with senior executive at Hyundai China, August 2009

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