

KEYS TO MAKING CARS

The twentieth century may well be remembered as the century of the automobile. In the twenty-first century, though, the automotive industry seems to need a model change to fit into a new view of the world's needs. Jeannette Cézanne reports.

The automotive industry currently occupies one of the largest manufacturing sectors worldwide and, in addition, has a tremendous number of allied dependent industries – first and second tier sub-suppliers – all of which are currently dealing with issues of change.

The most significant change is the restructuring of the industry into fewer, and larger, players. This consolidation has been going on almost since the industry was born. Today, many brands belong to the same group, and large sub-suppliers produce for many brands/groups. Six groups, General Motors, Toyota, Ford, Renault/Nissan, Volkswagen and Daimler Chrysler account for some 70% of global sales.

The market news is mixed. Automobile production declined slightly in 2003-2004 in Germany, Western Europe and Japan, although Toyota and, more recently, Nissan have experienced what *The Economist* terms "unusual success". China, on the other hand, is showing substantial growth and huge investments are presently being made in Chinese car plants. According to Zhu Yiping, the Chinese auto association's spokesperson, "both vehicle output and sales will top five million units this year".

Squeezed margins

In all areas of the motor vehicle industry, the key to success is as it has always been – productivity and quality. Japanese carmakers, particularly Toyota, have served as a model in the industry for the

last 20 years when it comes to quality, efficiency and lean manufacturing. Most car factories around the world have followed the Japanese example. "The bedrock of our philosophy," agrees a Toyota spokesperson, "is quality, dependability, and reliability."

Profit margins among all players are being squeezed relentlessly. They have, in fact, been showing a steady decline for some time. Profits were at 20% in the 1920s, 10% in the 1960s, and are currently at less than 5%; some automobile manufacturers are even losing money.

"To secure profits, the production processes must function extremely well with shortest possible downtimes," says Maria Rosell of Alfa Laval. "For example, the condition of industrial liquids such as wash liquids, coolants and cutting oils affect the performance, the product quality – and the bottom line. These liquids are expensive to buy and dispose of. With proper temperature regulation and cleaning, car producers can keep their industrial liquids in service for a long time and thus decrease costs and environmental impact."

Since the volume car industry is running out of growth, an important success factor for the car makers today is to have flexible factories that are able to switch easily from the production of one model to another to meet the increased fragmentation of the car market. Because this fragmentation leads to lower production runs, flexible production is needed in order to keep capacity utilization high.

The trend is green

The major trends that influence vehicle production involve three issues: economy, safety, and ecology.

In terms of economy, hybrid-electric cars (see below) are clearly the most

important measure, with petrol consumption a major concern. According to Plunkett Research, "2004 was a year in which high gasoline prices started a sea change among consumers that will finally create significant demand for fuel-efficient vehicles."

Recent years have seen an increase in active safety measures, with more on the way. Side airbags, active suspension systems, and navigational aids are already available, along with sensitive thermal-imaging equipment. The future holds the possibility of radar systems that will measure one's proximity to other cars and signal the driver before he or she hits another car.

Industry experts agree that providing a 'greener' approach to the production of automobiles is the essential current trend, both because of legislation and because of consumers' increasing dissatisfaction with pollution.

"The current trends are engineering solutions for cleaner cars with lower fuel consumption," says Christian Wuest of *Der Spiegel*, citing new hybrid technologies and cleaner diesel engines. "Consumers and emissions regulators," notes Plunkett Research, started (in 2004) to take a renewed interest in advanced diesel engines that offer exceptional performance and fuel economy while offering the benefits associated with petrol engines.

Enhanced regulations

A similar recent Alfa Laval innovation is an efficient solution for cleaning trucks' and buses' crankcase gases. Emission regulations for diesel engines are getting stricter. They require control of total engine emissions to an increasing extent (including substantial reduction of oil droplets and soot particles in crankcase ventilation gases).

The ultimate goal is 'zero emissions' vehicles (ZEVs) and, according to *The Economist* "the only conceivable ZEV is a car powered by an electric motor that runs on a fuel cell. A fuel cell combines hydrogen with oxygen from the air to produce water. The process generates an electric current strong enough to power a car."

But fuel cells are still extremely expensive and it will be a long time before cars based on this technology become a realistic alternative. In the meantime hybrid-electric cars are the best way to decrease carbon dioxide and other emissions and most car companies are now introducing hybrids. These vehicles hook a small engine up to an electric motor and a storage battery. The electric motor runs the car at slow speed and during stop-start motoring and the conventional engine takes over on the open road.

Opportunities

According to Bernd Gottschalk, president of the International Organization of Motor Vehicle Manufacturers (OICA), the automotive industry remains a reliable factor in the global economy. "The global automotive industry is on course to expand this year," he notes. Total vehicle production went up by over 6% in 2004, with the largest growth rate in the heavy commercial vehicle sector.

But, according to *The Economist*, even if the industry still has a huge social and political influence, it is becoming a sunset industry and has been in financial terms due to its declining profit margins. This is a serious threat and the answer is for the industry to put measures in place to meet current trends and challenges on both a production and a consumer level.

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