Germany: Alternative Drives - Electric and Hybrid Technology Vehicles

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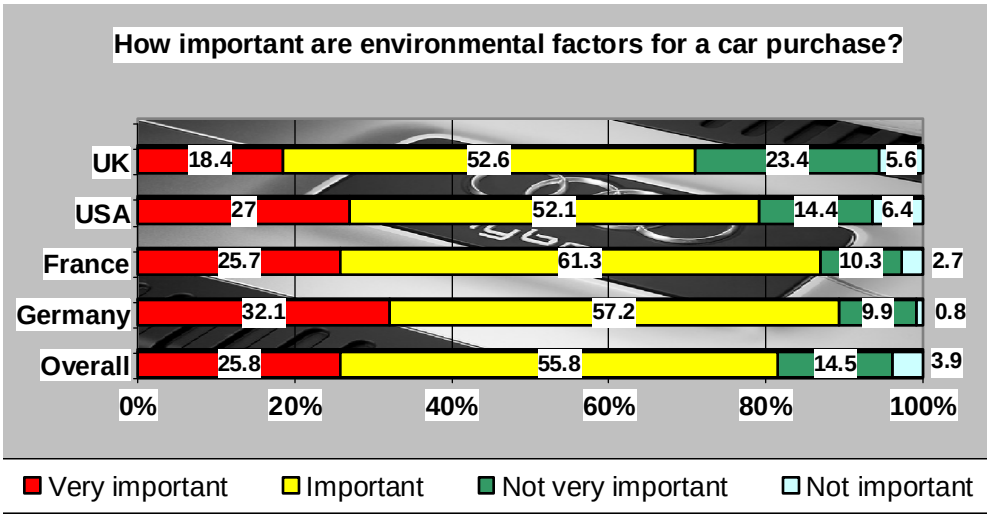
Summary

The ongoing discussion about declining fossil fuels, increasing energy costs, and the environmental damages of CO^2-emissions has led to increased worldwide R+D activities in the automotive industry. Since the automobile market is one of the most important sectors for the German economy and the country has taken an international lead in the effort to reduce CO^2-emissions, developers of all major OEM's in the German automotive industry are developing alternative drives such as electric motors and hybrid technology.

The demand for such technologies is immanent. Studies show that approximately 90% of Germans state that environmental factors are either very important or important for their next car purchase, more than in any other country.

Additionally, traffic volumes in Germany are continuously growing. The transport sector is facing the major challenge of trying to cut CO^2 emissions and reduce its dependency on oil while also safeguarding a high level of mobility.



Source: puls Marktforschung GmbH, Kundenanforderungen an das Automobil heute und morgen 11/2007

Several major trade fairs are relevant for alternative drives in Germany. The U.S Commercial Service strongly suggests that American exporters consider participating in some of these fairs because they are regarded as important vehicles to enter the German and other major European markets. The U.S. Commercial Service often partners with fair organizers to be able to offer attractive packages for U.S. exhibitors at featured events. See details below.

Hybrid Technology

Hybrid systems are the first step towards traffic few or no emissions. Most hybrid cars offer both, a conventional gasoline or diesel engine and an electric motor, with the ability to power the vehicle by either one energy source independently or in tandem.

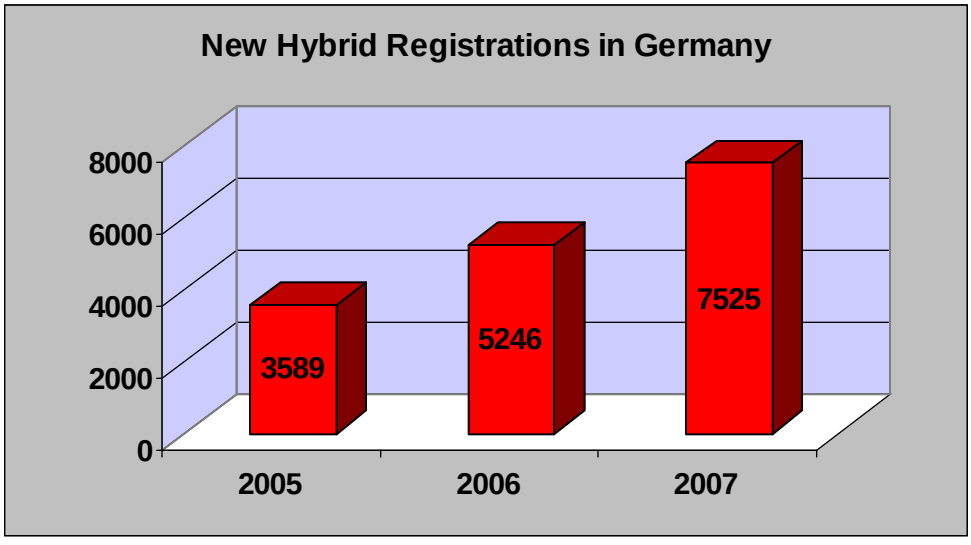
Although the market for hybrid cars among German manufacturers is limited at the moment, all major manufacturers will have at least one hybrid concept ready to go into production within the next two years.

German OEM Hybrid Model Launch Forecast

Manufacturer	Hybrid Model	Start of Production (Est.)
Audi	Q7	2008
BMW	7 Series	approx. 2010
	X5	
	X6	
Daimler	S Class	2009
	M Class	
	GL Class	
Opel (GM)	Astra	2010
Porsche	Cayenne	2010
Volkswagen	Golf VI	2009

Source: Invest in Germany Research, Automotive News Europe, Automobilwoche, Spiegel 5/2008

Although German makes are still absent from the market, hybrid sales in the country have taken off. According to the German Federal Bureau of Motor Vehicles and Drivers (KBA), new hybrid registrations rose by 43% in 2007 alone. The hybrid fleet in Germany has increased from a total of 11,275 to 17,307 vehicles in the same year. Overall new vehicle registrations in Germany, however, have decreased by 9.2% compared to 2006. As the options grow and more hybrid cars become available, the number of new hybrid registrations is expected to continue to rise considerably in the years ahead.

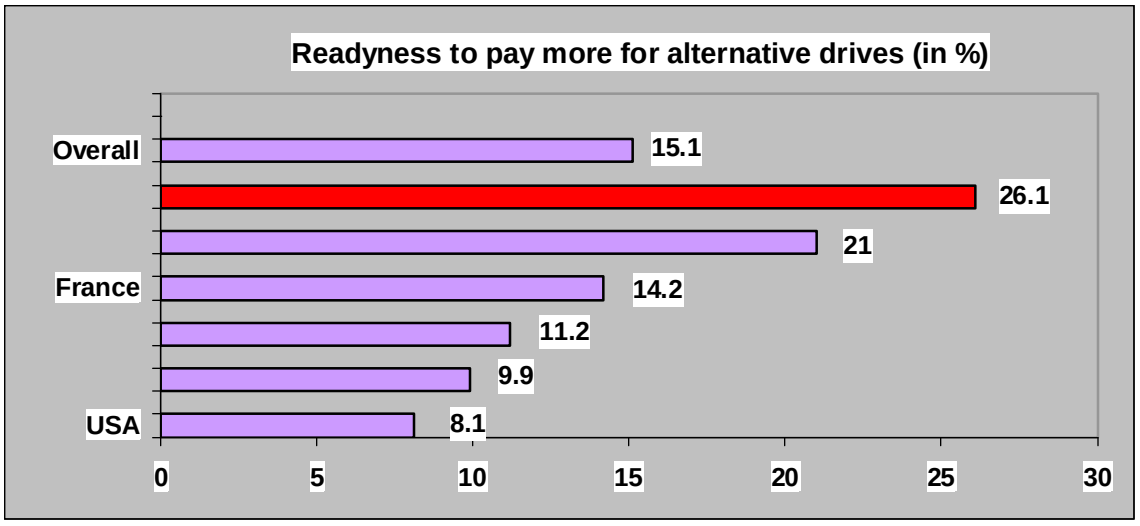


Source: Kraftfahrtbundesamt

Hybrids are not only environmentally sound but also economically interesting for German consumers. The price of gasoline reached a historical high in July 2008 with EUR 1.55 for one liter regular-grade gasoline (approximately USD 9/gallon).

Fuel-saving diesel engines have been very popular among German commuters for years. Though diesel cars are more expensive, over 50% of all newly registered cars had diesel engines in 2007. In addition to the better gas mileage, diesel fuel used to cost much less than regular gasoline. The price for diesel price, however, has almost caught up to regular gasoline, making the diesel alternative less attractive for commuters.

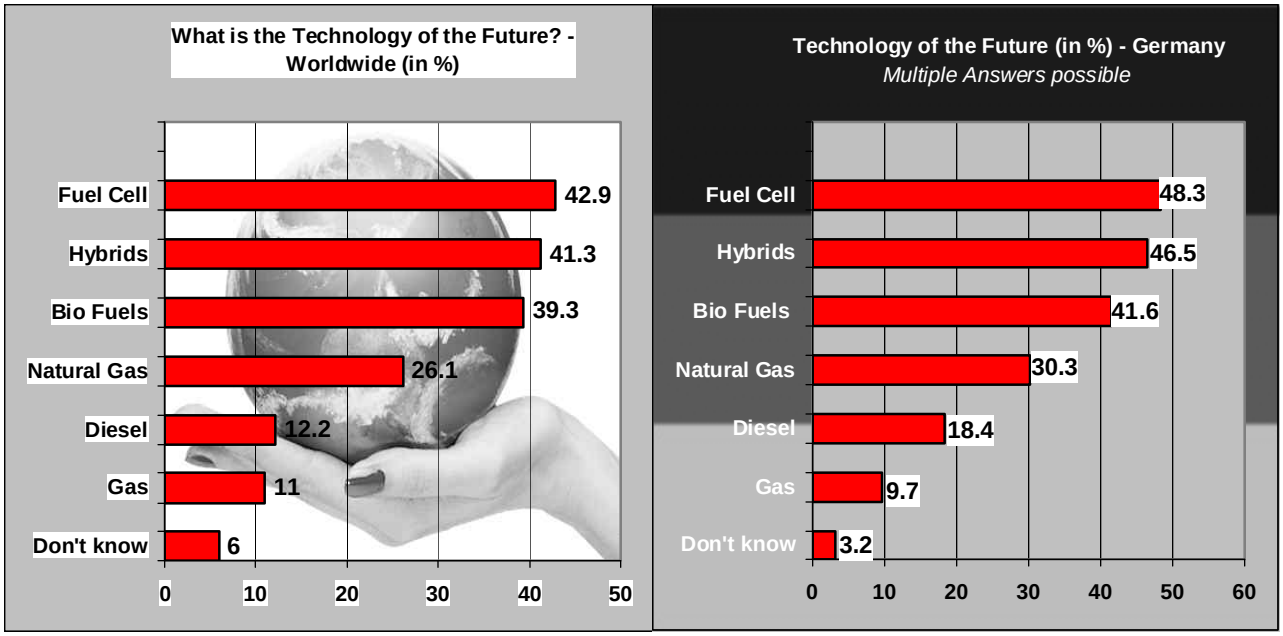
Compared to other countries, the willingness to pay more for alternative cars is fairly high in Germany. According to recent market research , more than 26% of those surveyed would consider this option as compared to only 8% in the United States



Source: puls Marktforschung GmbH, Kundenanforderungen an das Automobil heute und morgen, 12/2007

Another survey states that more than four percent of the respondents would buy hybrid as their next car. Continental AG, one of the largest tire and parts manufacturer in Europe, estimates that the German market for hybrids will revolve around 70,000 vehicles per year.

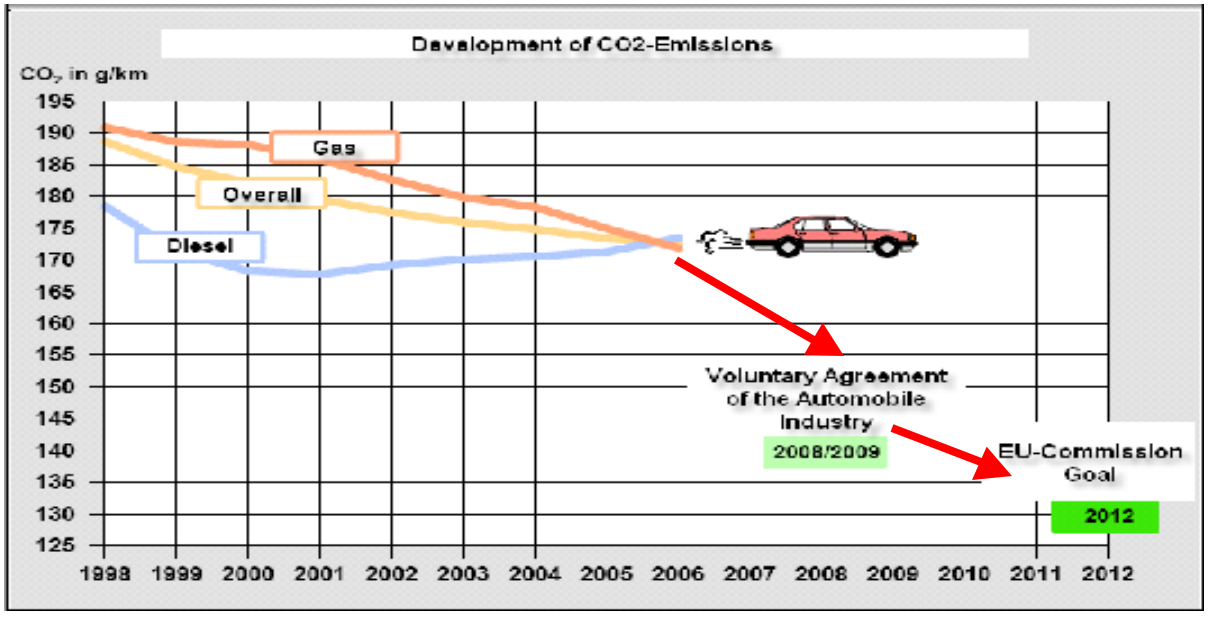
Almost fifty percent of the Germans believe that the future belongs to hybrid technology and fuel cell technology. This relatively high acceptance for those technologies seems to indicate a solid demand for alternative drives.



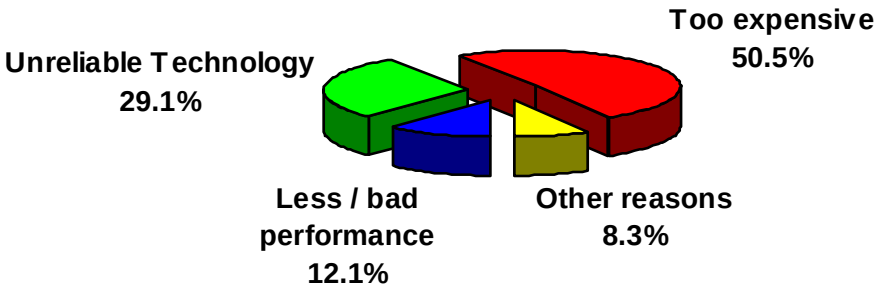
Source: puls Marktforschung GmbH, Kundenanforderungen an das Automobil heute und morgen, 12/2007

Government Incentives

Current negotiations in the EU regarding climate protection and the CO^2-emission targets for the automotive industry prompted the German government to introduce tax incentives for vehicles with low CO^2-emissions. German manufacturers need to drastically step up their efforts to meet the target value of 130 Gram CO^{2-}emission per kilometer until 2012. The current average fleet value for German automobiles is presently at 173 g CO^2/km.



Reasons against alternative fuels mentioned by German drivers



Source: puls Marktforschung GmbH, Kundenanforderungen an das Automobil heute und morgen

As the above chart shows, the strongest hurdle to overcome will be to make alternative drives price competitive and to gain customer confidence.

Plug-in Hybrids (PHEV)

Plug-in hybrids are more fuel-efficient than regular hybrids because the electric motor can be charged in a standard power outlet. The typical battery uses a lithium-Ion.
Toyota is currently testing its plug-in hybrid 'Prius PHV' in several European cities, but long-term studies on the practical use of the vehicles are not yet available.

Volkswagen was the first German manufacturer to present its PHEV prototype "Space Up!" at the LA Auto Show in November 2007. However, there is no prediction on when the prototype will go into mass-production. Toyota announced that it will introduce a ready-for-the-consumer PHEV version at the Detroit Auto Show in January of 2009. Daimler is presently experimenting with PHEV as well as fuel cell versions for its "Sprinter" vans. Other manufacturers working on PHEV developments include Renault (Kangoo Cleanova II), Volvo (Recharge), BYD (F3 DM).

Presently there is not yet a sufficient infrastructure for recharging electric motors throughout Germany, so plug-in technology is only usable for households or companies with private garages.

Although hybrids and plug-in hybrids present a reasonable transitional solution, it appears that these technologies will not be an alternative drive concept in the long term as this concept seems to be too inefficient, both economically as well as ecologically.

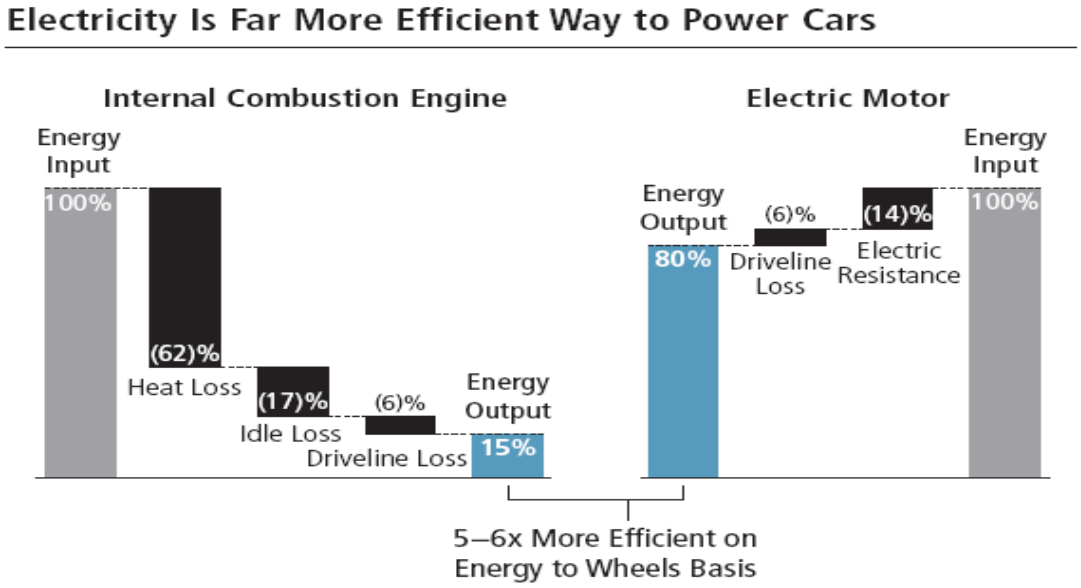
Electric Vehicles

Developers in almost all large automotive corporations are convinced that the future of the automotive industry will be electric motors.

Electric vehicles (EV) are seen as a win-win situation for the environment, customers and the economy alike since they use energy much more efficiently than gasoline engines. The benefits are obvious: because they do not use fuel of any kind, they are zero-polluting and create no tailpipe emissions. Their performance is quiet, smooth and quick. However, all attempts to effectively use full electric technology in cars have failed

due to the lack of battery capacities. A range of less than 100 kilometers and recharging periods of several hours generally defy the suitability for daily use. Recent developments in battery technology, however, are constantly increasing the range. Presently the batteries are mostly Lithium-Ion based, but Toyota, for example is experimenting with NiMH for its EV Prius model.

Compared to conventional vehicles, the EV technology is much more efficient. The energy output of electric motors is 5-6 times higher than that of internal combustion engines, which is expected to be the main market driver for EVs in times of increasing fossil fuel prices.



Source: Alliance Bernstein Report "The emergence of hybrid vehicles"

Though mostly scooters (and not cars or vans) are powered electrically in Germany, the German government has already recognized the positive effect of the technology on the environment and has exempted electric vehicles from all motor vehicle taxes for the first five years.

Although the emphasis is clearly set on hybrid technology because it seems more practicable at the moment, German OEM's are currently researching EV options very actively. GM (Opel) recently announced that it will release the first electric vehicle in Germany in 2010. Daimler is planning on releasing its S 400 Hybrid as the world's first hybrid with a high-performance lithium-ion battery in the summer of 2009.

German parts and equipment manufacturers such as Bosch and Continental are also feverishly working on alternatives to the combustion engine. Other manufacturers are sure to follow in order to keep up with the highly competitive automobile market in the country. As stated by the trade, the next major auto trade fair, IAA, talking place in September 2009 in Frankfurt will see electric vehicles by Chevrolet , Opel, Daimler, Nissan and other major car manufacturers ready to be mass-produced. And, electric vehicles are expected to achieve a market share of up to 10% by 2020.

The major manufacturers have long been reluctant to announce breakthroughs in electric technology. They have been successful with the internal combustion engine for a hundred years and have invested billions in patents and factories. However, with dwindling oil resources, increased energy prices and the need to change the concepts of mobility in heavy populated areas, they have come to realize that there are opportunities for EVs (maybe in combination with fuel cells) in the near future. Hybrids and Plug-in hybrids are forward-looking technology, but they still use gasoline as the major means to power the vehicle.

In November 2007, a number of German large enterprises (e.g. BASF, Bosch, Volkswagen) have joined forces and launched the alliance "Lithium Ionen Batterie LIB 2015" to combine scientific know-how and economic power for the research on the high-performance Lithium-Ion battery. They see it as a key technology in the highly competitive market for alternative drives in Germany because it can be used as an effective fuel replacement and see distinct advantages over NiMH batteries as used by Toyoya. The participating companies have committed to invest EUR 360 million for research with another EUR 60 million granted in subsidies.

Trade Events

There are several major trade shows in Germany relevant for alternative drive technology. The U.S. Commercial Service encourages American exporters to visit or participate in these trade shows.

- Automechanika, Frankfurt, September 16-21 2008
- Hanover Fair, Hanover, April 20-24 2009 (with a focus on energy, clean moves and fuel cell technology)
- IAA, Hanover, September 25 – October 2 2008
- Essen Motor Show, Essen, November 29 – December 7 2008

Please visit www.buyusa.gov/germany/en for a detailed list of trade shows and an overview of what the U.S. Commercial Service has to offer to American exporters at featured events.

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