

■ *Two principal forces—patterns of growth in emerging markets, and environmental impacts and actions—will shape passenger car markets over the next dozen years*

■ *BCG has envisioned two hypothetical outcomes for each of these forces—and their interactions—to come up with three plausible scenarios for automotive markets in 2020: Green Freeway, Temporary Utopia, and Stranded Masses*

■ *Depending on how the scenarios play out, sales of passenger cars in rapidly developing economies, which were 27 percent of global sales in 2007, may be 40 to 47 percent of sales in 2020, and much of the growth will come from smaller cars*

■ *Companies should explore the implications of each scenario for their markets and product lines and take strategic action now*

# Envisioning an Uncertain Future

## Scenarios for Passenger Car Markets in 2020

New markets, new product segments, and new players are rewriting the rules of the passenger car industry and threatening to upend the traditional order. However, there is considerable uncertainty about the continuing pace of these disruptive developments and their eventual outcomes. Will sluggish investment in road infrastructure stymie the growth of demand in emerging markets? What effect will spiraling oil prices have on demand for small, fuel-efficient cars and on efforts to develop alternative technologies? Will new players in emerging markets be able to defend their domestic positions against competitors that have global presence and economies of scale? How will the pressure for tighter emission regulations affect growth and alter the competitive landscape?

To explore possible directions for the world's passenger-car markets and identify strategies that will separate industry winners from losers, we adopted a scenario-based approach. Traditional forecasting and planning methods, which tend to rest on deterministic thinking, generally cannot accommodate high degrees of uncertainty. Scenario-based approaches, in contrast, can provide a robust platform to support effective decision making through tumultuous change. To develop our scenarios for passenger car markets, we first identified the key forces that are likely to shape the future of the industry, then assessed their probable strength, impact, and mutual interactions. Finally, we envisioned three primary pathways along which markets may evolve.

Automotive OEMs and suppliers that are competing directly for a share of the prize won't be the only ones shaping these pathways. Other active stakeholders will include energy companies, urban planners, legislators, providers of mass transportation systems, "green activists," and nongovernmental organizations (NGOs) that focus on environmental issues such as sustainability. To arrive at fresh perspectives on the fundamental drivers of change, we reviewed numerous publications from diverse sources and talked to a large number of people both inside and outside the industry.

On the basis of this research, we identified six broad categories of forces that will play a significant role in shaping the passenger car landscape: urbanization, shifting lifestyles and consumer choices, evolving market characteristics, globalization, patterns of growth in emerging markets, and environmental impacts and actions. (See Exhibit 1.) Clearly, these six forces are subject to considerable uncertainty in terms of the pace and direction of their development, as well as their potential impact on the future of the passenger car industry.

## Envisioning the Future

Our analysis suggests that two of the six forces—patterns of growth in emerging markets, and environmental impacts and actions—represent a particularly potent mix of high possible impact and high uncertainty, and therefore will play the strongest role in shaping alternative scenarios for passenger car markets. For each force, we have envisioned a pair of possible outcomes.

**Patterns of Growth in Emerging Markets.** In a number of emerging markets, rapid overall economic

growth masks stark internal disparities in growth patterns. In India, according to the Economist Intelligence Unit's 2008 Market Indicators and Forecasts, median household income grew by about 89 percent from 2002 to 2007—but less than 5 percent of households in 2007 accounted for almost 60 percent of total household income. In China, which has been very successful in reducing the overall level of poverty, there continues to be wide regional disparity in development, with the top five coastal provinces accounting for more than 42 percent of the country's GDP in 2007. If patterns of growth in emerging markets remain so disparate among economic strata and regions, most of the demand and spending power will be concentrated in a few large cities, where product needs and buying behavior will mirror those in developed markets. In addition, the populations in these cities will continue to swell as migrants flock there in search of better economic prospects.

If, however, growth patterns in emerging markets were to become more broad-based, they would generate a very different outcome. Rapidly developing economies (RDEs) would experience strong consumption and wealth creation at all levels of the income pyramid, while regionally dispersed economic activity would lead to new economic centers among second- and third-tier cities. Which of these alternative outcomes—or something in between—in fact emerges will have direct bearing on both the demand for passenger cars and the mix of product segments.

**Environmental Impacts and Actions.** Global warming is already affecting lives. Atmospheric concentration of carbon dioxide has risen by about 30 percent since the late 1800s. Road transportation has been estimated to account for almost 15 percent of greenhouse gas emissions, making it one of the largest polluters.

Governments around the world are experimenting with ways to tackle the interlinked challenges of greenhouse gas emissions and fossil fuel dependence. The European Union has systematically tightened emission standards for all OEMs. Since 2006, Japan has been on a course toward adopting standards that will make it, in 2015, the country with the lowest average fleetwide greenhouse-gas emissions from new passenger cars, at less than 125 grams of carbon dioxide per kilometer.

Concerns about global warming are beginning to be voiced in emerging markets as well. In China and India, fiscal incentives encourage the production and sale of smaller-engine cars that are fuel efficient and have lower emissions than larger models. One possible outcome

### Exhibit 1. Six General Forces Will Shape Passenger Car Markets

<b>Urbanization</b>	<ul style="list-style-type: none"> <li>◇ Patterns of migration within emerging markets</li> <li>◇ The pace of development of urban centers, suburbs, and satellite towns</li> <li>◇ The pace of growth in urban infrastructure, including roads and mass transportation</li> </ul>
<b>Shifting lifestyles and consumer choices</b>	<ul style="list-style-type: none"> <li>◇ Attitudes toward trading up and trading down; polarization of product segments</li> <li>◇ Choice of features: convenience versus economy, back-seat features for chauffeur-driven executives</li> </ul>
<b>Evolving market characteristics</b>	<ul style="list-style-type: none"> <li>◇ The growth of relatively new consumer segments: women, senior citizens, and youth</li> <li>◇ The need for personal identity coupled with ties to chosen communities</li> </ul>
<b>Globalization</b>	<ul style="list-style-type: none"> <li>◇ The expected lowering of tariff barriers, leading to the acceleration of trade flows</li> <li>◇ The emergence of trading blocs and free-trade agreements</li> <li>◇ Nationalistic sentiments driving consumers' choice of brands</li> </ul>
<b>Patterns of growth in emerging markets</b>	<ul style="list-style-type: none"> <li>◇ Growing demand in emerging markets as incomes rise, making cars more affordable</li> <li>◇ Concentrated versus broad-based patterns of economic development across income segments and regions</li> </ul>
<b>Environmental impacts and actions</b>	<ul style="list-style-type: none"> <li>◇ Levels and volatility of oil prices; alternative energy sources and their commercialization</li> <li>◇ Greenhouse emissions and their impacts</li> <li>◇ Degree of public pressure for regulations and other legislation</li> </ul>

Source: BCG analysis.

is that tough new standards and regulations will prevail in these markets. Alternatively, near-term economic goals in RDEs might overshadow longer-term environmental concerns, allowing strong industrial lobbies to continue to block decisive regulatory action. The latter eventuality would result in only token additional taxes on larger cars that are less fuel-efficient, and gradual—rather than stringent—tightening of emission norms.

These two forces—patterns of growth in emerging markets, and environmental impacts and actions—should significantly affect the pace and direction of growth in the global passenger-car market over the next dozen years. Sales in RDEs, which were 15 million units in 2007, representing approximately 27 percent of global sales, may increase to 31 million to 40 million units in 2020, representing 40 to 47 percent of global sales. Much of this growth will consist of sales of smaller cars. The global market for small cars may amount to 24 million to 38 million units, up from 15 million units in 2007. The size of the various markets—and the breakdown between the numbers of small and large cars sold in each of them—will depend on which scenarios are realized in which markets. It is important to note that these numbers reflect generalized outcomes in which a particular scenario plays out across different markets. In reality, of course, different scenarios may play out in different markets, moderating the global sales figures.

### Three Scenarios for 2020

The two hypothetical outcomes for each of the two forces discussed above will intersect to create three plausible scenarios for the year 2020, which we have named Green Freeway, Temporary Utopia, and Stranded Masses. (See Exhibit 2.)

**Green Freeway.** In this scenario, income and wealth are more broadly distributed, making cars affordable for many more households. Worldwide demand for passenger cars reaches 86 million units in 2020, with emerging markets accounting for 40 million units. However, increasing concerns about air pollution, oil prices, and other environmental impacts, together with growing health concerns, have prompted consumers to show a marked preference for “green” products. Responding to consumer activism, legislators have given real teeth to green regulation, while suppliers have accelerated their innovation of green technologies. As a result, there has been a distinct shift in demand toward smaller cars, even among those consumers who could afford larger ones. Meanwhile, passenger car sales in RDEs have eclipsed those in the Triad markets (Japan, North America, and

Western Europe). This rapid growth has been driven primarily by strong sales of small cars, which—at 38 million units—constitute approximately 44 percent of the global market.

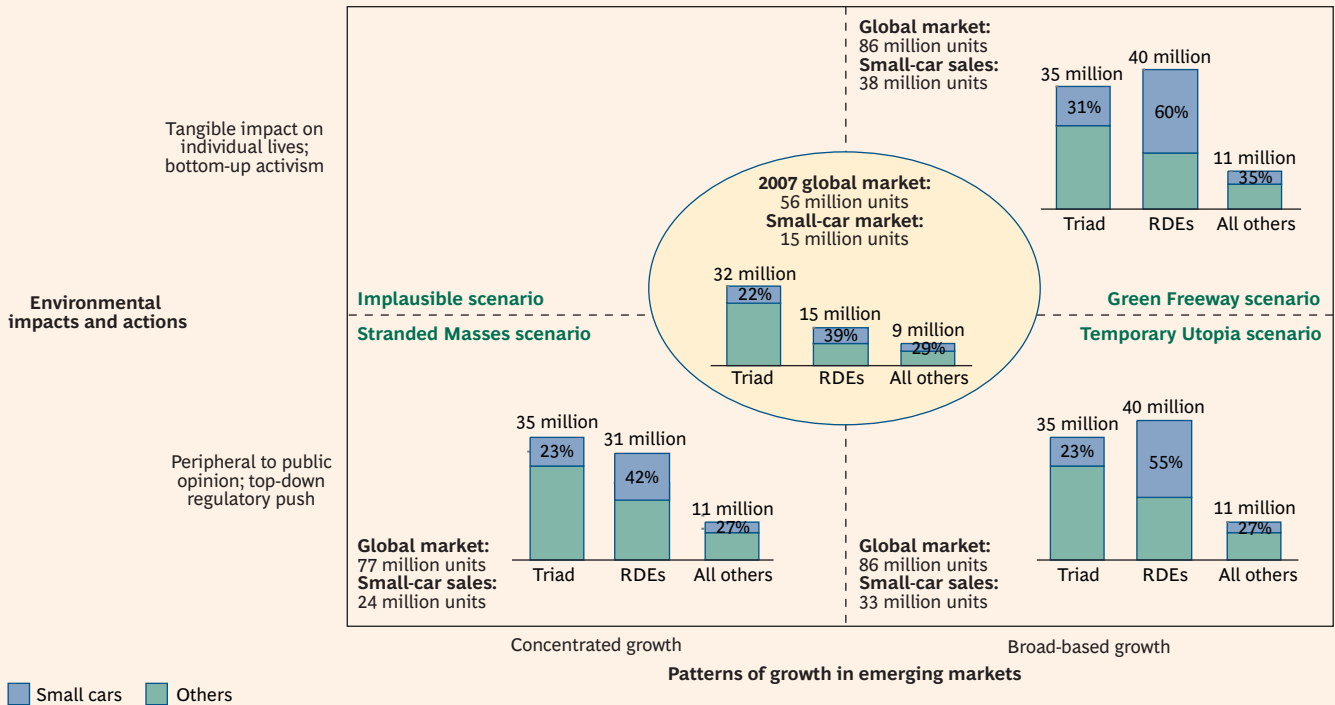
**Temporary Utopia.** Here, too, the benefits of economic growth are being shared by all sectors of society, reflecting the success of strong economic-policy initiatives. In this scenario, however, environmental movements remain fragmented and elitist. Because there is little popular support for protection of the environment, industrial lobbies have been able to dilute legislative initiatives and push back development of green technologies. As in the Green Freeway scenario, global demand for passenger cars in 2020 is 86 million units and passenger car sales in RDEs exceed those in the Triad markets by 5 million units, with sales of small cars again driving much of the growth. At 33 million units, however, the small-car segment represents only 38 percent of the global market.

**Stranded Masses.** In this scenario, economic activity has remained concentrated and population migration has continued apace. Rapid economic development has led to increased congestion and rising pollution in major cities, with haphazard urban growth proceeding unchecked. As in the Temporary Utopia scenario, green legislation has found no popular support and remains ineffective. Lacking alternatives, large population segments endure difficult living and working conditions. This is the most pessimistic scenario for worldwide demand for passenger cars, which we estimate at 77 million units—with small cars accounting for only 24 million units, or approximately 31 percent of global sales.

### Strategic Questions for OEMs

Each of these scenarios calls for different actions and entails varying tradeoffs by automotive players. Should they bet on the Green Freeway scenario and make large investments in developing a low-cost small-car platform that would work across emerging markets? Or should they invest in developing new capabilities to create low-cost platforms for different segments, as Renault has done with the Logan? The latter approach could make strategic sense in both the Green Freeway and Temporary Utopia scenarios. Alternatively, should automotive players anticipate the Stranded Masses scenario, in which the smaller worldwide market might converge around globally aligned consumer preferences and product choices?

Exhibit 2. Demand for Passenger Cars in 2020 Will Vary Under Different Scenarios



Sources: Global Insight; The Economist Intelligence Unit; BCG analysis.

Note: The Triad markets consist of Japan, North America, and Western Europe; the RDEs consist of Brazil, China, India, Indonesia, Iran, Malaysia, Mexico, Russia, South Africa, Taiwan, Thailand, and Turkey. Figures for 2007 are a combination of actual data and estimates.

Should industry executives expect India to be among the top ten markets in the world, or will its potential development fall victim to uneven growth across the country? Will the emerging markets warrant the development of country-specific strategies for products, manufacturing, and sales—or will there be sufficient commonality across markets to allow automotive players to deploy regional or even global strategies?

What are the present-day implications for industry participants under each of the three scenarios? For instance, for the Green Freeway scenario to play out in 2020, emerging markets would need to adopt aggressive green policies within the next five years, offering large incentives to local players to develop low-cost green technologies. Rapidly growing markets could provide a very supportive environment in which local auto companies could challenge current global players for leadership. Some players in China are already in advanced stages of developing battery-operated cars for commercial launch, hoping to leapfrog intermediate technologies such as “mild” hybrids. The government of Thailand recently invited OEMs and sup-

pliers to invest in developing and manufacturing green vehicles.

What should global players do now to plan for such an eventuality? Should they move to participate in these evolving ecosystems by developing partnerships or acquiring the likely winners while they are still affordable? Or should they invest in developing their own low-cost green technologies specifically suited for emerging markets?

**A Time for Action**

Because the direction and pace of the two forces—patterns of growth in emerging markets, and environmental impacts and actions—are still highly uncertain, industry participants would do well to analyze the specific implications of each scenario for their individual competitive positions. Among the strategic moves they should consider, some may create value regardless of which scenario comes into play. One such move, for example, might be to establish a significant presence in one or more emerging markets. Other strategic moves

may influence the development of these or other scenarios; such moves might include catalyzing demand for green cars through rapid technological advances and narrowing price differentials, possibly while sharing technology development costs and mitigating risk by forging alliances with partners. A third category of strategic moves is dependent on the emergence of a particular scenario. For example, broadening the reach of a company's distribution network in emerging markets would be an imperative in the Green Freeway scenario.

Exploring the implications of each scenario will help companies develop the sensory capabilities needed to track and interpret lead indicators in the social, economic, and political environments affecting their markets. For example, how many global automotive companies are tracking public-interest litigation in the Supreme Court of India, which has been determining the pace of implementation of green policies in that country?

Companies that follow and analyze such lead indicators will gain advance notice of a developing scenario before it becomes a full-blown reality. They will thus be able to take appropriate, scenario-specific actions to fortify their positions well ahead of their competitors.

Others will find themselves forced to react—very likely too late.

Arindam Bhattacharya  
Kevin D'souza  
Xavier Mosquet  
Georg Sticher  
Arvind Subramanian

*Arindam Bhattacharya is a partner and managing director in the New Delhi office of The Boston Consulting Group. Kevin D'souza is a consultant in the firm's Mumbai office. Xavier Mosquet is a senior partner and managing director in BCG's Detroit office. Georg Sticher is a senior partner and managing director in the firm's Munich office. Arvind Subramanian is a partner and managing director in BCG's Mumbai office.*

You may contact the authors by e-mail at:  
bhattacharya.arindam@bcg.com  
dsouza.kevin@bcg.com  
mosquet.xavier@bcg.com  
sticher.georg@bcg.com  
subramanian.arvind@bcg.com

This article was sponsored by the automotive sector of the Industrial Goods practice.

To receive future publications in electronic form about this topic or others, please visit our subscription Web site at [www.bcg.com/subscribe](http://www.bcg.com/subscribe).

© The Boston Consulting Group, Inc. 2008. All rights reserved.  
7/08