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One billion. By 2020 or sooner, that's how many cars and light trucks there will be on the road around the world. That's one for every 6 1/2 people on the planet -- and over 25% more vehicles than we have today.

For auto giants General Motors Corp. and Ford Motor Co., racked by billion-dollar losses and slumping market share in the U.S., that milestone represents the potential for growth and a rare cause for optimism. But it also represents a huge challenge for the auto makers -- as well as regulators, environmentalists and ordinary people trying to get from place to place.

The auto boom will only add to the congestion in major cities, as well as deepening the world's thirst for petroleum and spewing even more carbon dioxide into the air. That will leave drivers facing rising costs and traffic headaches, and force the auto industry to deal with rising demands for fuel efficiency, pollution control and a host of other rules and regulations. For instance, worried that the European landscape will be littered with junked cars, the European Parliament has demanded that car makers devise ways to recycle and reuse 95% of the weight of a vehicle by 2015.

Longer term, the struggle to accommodate one billion autos on the planet may lead to a rethinking of the car's place in society.

Automobiles have long been symbols of personal freedom. They've enabled people to live in the country and earn better wages in town. Auto makers have enjoyed special status as national industrial champions, protected to some degree from competition in return for providing high-paying jobs on a mass scale.

The view of cars as a symbol of all that's right in the economy and society still holds a lot of power, especially in developing countries. In India, car sales are booming. Auto makers are ramping up production as the government loosens restrictions on foreign auto makers and increases spending on roads to meet the demands of an increasingly affluent middle class. China, meanwhile, is engaged in a massive road-building campaign to accommodate the surge in privately owned vehicles. Chinese auto makers are talking up ambitious plans to crack the U.S. market with their cars within two years.

Managing Growth

"There's a perception the industry is stagnant," says Paul

Ballew, executive director of market and industry analysis at GM, the No. 1 auto maker in global sales. In reality, Mr. Ballew says, the auto industry's challenge in coming years will be "managing growth."

At the same time, governments and car makers are beginning to demonstrate some concern that too many cars could be too much of a good thing.

In London, the city government has imposed a tax on cars entering the center of the city in an effort to encourage commuters to use mass transit. Other cities around the world are considering similar policies to ease congestion. The impetus for limiting traffic isn't coming just from environmentalists. The Partnership for New York, a business group, has urged the city to consider a congestion tax similar to London's, among other measures, to ease the city's gridlock.

"We have a serious problem with lost productivity in our economy" that costs the New York metro area $6 billion a year, says Kathryn Wilde, president and chief executive officer of the partnership.

Others are looking for ways to speed the flow of cars without imposing limits on their use. In the U.S., communities are experimenting with systems that do a better job of synchronizing traffic lights with traffic flow. Car makers and radio broadcasters, meanwhile, are rolling out systems that feed real-time traffic information to navigation systems in cars, giving drivers a chance to avoid delays.

The auto industry also faces a renewed challenge to make vehicles that burn less petroleum -- for both environmental and political reasons. And it seems likely the industry will deliver.

Since the 1970s, when concerns about smog prompted the first Clean Air Act in the U.S., auto makers have complained that demands for cleaner or more fuel-efficient cars would do nothing but cut into profits. But at most critical points, the industry has developed the technology to overcome the hurdles, such as Honda Motor Co.'s clean-running CVCC engine or the first exhaust-scrubbing catalytic converters pioneered by GM in the 1970s.

A Clean Start

Now car makers are redirecting research budgets and marketing resources toward technologies designed to reduce petroleum consumption. Rising demand for motor-vehicle fuel is "perhaps the most strategic development...in international oil-and-gas geopolitics," says Fatih Birol, chief economist of the International Energy Agency in Brussels.

Toyota Motor Corp. scored a coup in the U.S. market with its highly efficient Toyota Prius gasoline-electric hybrid, a distinctively designed car that has become a green status symbol. Toyota is now pushing gas-electric hybrid technology, in various forms, across a wide array of its vehicles, from a high-performance Lexus luxury sedan to crossover SUVs to its best-selling model, the Toyota Camry.

Ford, which racked up record profits during the 1990s by selling SUVs, is now charting a new course under Chairman and Chief Executive William Clay Ford Jr. The company has cut back its SUV-making capacity and, despite slumping profits, has pumped money into developing its own hybrid-vehicle technology.

At DaimlerChrysler AG, the emphasis is on developing highly efficient diesel engines that are also clean enough to meet tough U.S. clean-air regulations. This fall, DaimlerChrysler's Mercedes unit plans to start offering an E Class sedan with the first of its new Bluetec diesel engines that are designed to meet current U.S. clean-air regulations.

"If one-third of SUVs were driven by diesel engines, you could save the imports from Saudi Arabia in total" to the U.S. market, says DaimlerChrysler Chief Environmental Officer Herbert Kohler. Using fuels produced from rapeseed or other vegetation -- so-called biofuels -- could reduce oil consumption even more, he says. DaimlerChrysler recently committed to work toward expanding the use of biofuels to 10% of the total motor-fuels market.

Some industry leaders say new technology won't be enough to change America's oil consumption or driving habits. Michael J. Jackson, head of AutoNation Inc., the No. 1 U.S. auto retailer, says the time has come for the U.S. to impose higher gasoline taxes.

Of course, someone could perfect a means of personal transport that makes the four-wheel motorcar an antique. That's what Moller International Inc. hopes to accomplish with its experimental flying cars.

"For us in the industry," says GM's Mr. Ballew, "the next 10 years will be fascinating."

--Mr. White, The Wall Street Journal's Detroit bureau chief, served as contributing editor of this report.

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