



# TAKING THE HIGH (FUEL ECONOMY) ROAD

## WHAT DO THE NEW CHINESE FUEL ECONOMY STANDARDS MEAN FOR FOREIGN AUTOMAKERS?

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### KEY FINDINGS

- **The Chinese fuel economy standards are slightly more stringent than current fuel economy regulations in the U.S.** If the U.S. were to meet Chinese standards, fleet average fuel economy would need to increase by 5% for the Phase I (2005/2006) standards and by 10% for the Phase II (2008) standards.
- **Regulations could be tightened beyond 2008.** If China is serious about reducing domestic oil consumption, further fuel economy improvements will be necessary to offset escalating vehicles sales.
- **The Chinese standards will hit light trucks harder than cars.** The standards require more fuel economy improvements in the light truck segments than cars. In 2003, 66% of cars sold in China met the Phase I standards (with 35% meet the Phase II standard) while only 4% of SUV's and minivans already meet the Phase I standards (with no light trucks today meeting the Phase II standard). As a result, the standards are likely to disrupt future plans for automakers who intend to introduce larger and more powerful vehicles into the Chinese market.
- **Manufacturers have varying degrees of readiness to comply.** Ford has 100% of its 2003 sales already meeting the Phase I standards (with 72% for Phase II) while GM has only 42% of its 2003 sales meeting Phase I standards (with 32% for Phase II).
- **GM and DaimlerChrysler** might require higher capital expenditures in fuel economy improvements over the near term to meet the Chinese standards. **Toyota, Ford** and **PSA** are best positioned, requiring little or no investment over a longer period to meet the new standards.
- **Enforcement of the standards will be key.** It is not yet known to what degree the standards will be monitored and enforced by Chinese authorities, particularly for the Phase II standards. This leaves great uncertainty about the degree to which the standards may affect the financial performance of automakers in China.

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## MORE QUESTIONS THAN ANSWERS

The new Chinese fuel economy standards are an ambitious effort on the part of the government to regulate oil consumption from personal vehicles in China, a large contributor to China's growing dependence on foreign oil. This dependency is expected to increase dramatically over the coming years, with the amount of crude oil imported rising from 31 percent in 2002 to over 50 percent in 2007.<sup>1</sup> Over the next ten to fifteen years, China's oil consumption is expected to increase 4 percent per year, placing China as the world's second largest oil consumer behind the United States. However by 2020 China is expected to become the world's largest oil consumer, with total projected oil consumption of 27.6 million barrels a day compared to 26.4 million barrels a day consumed in the United States.<sup>2</sup>

Although we found the new standards to be slightly more stringent than those in place in the United States, there are important differences between the two countries regarding the maturity of the vehicle market that may ultimately determine the success of the Chinese regulations in dampening vehicle oil consumption. The U.S. has a mature vehicle market that is nearing saturation, growing at only 3 percent a year from 1992 to 2002. China, on the other hand, is an emerging market that experienced a vehicle sales growth rate of 50 percent in 2003 and is expected to grow at over 7 percent a year between 2005 and 2020.<sup>3</sup> Many in the auto industry believe that China will overtake the U.S. as the world's largest auto market between 2020 and 2025.

Given the dramatic increase in vehicle sales expected in China, it is unclear if the new standards will be significant enough to reduce China's projected dependence on oil imports. It is likely that China will need to continue to tighten fuel economy standards beyond 2008 to make significant reductions in oil consumption over the medium and long term.

The new standards in China are designed to bring about rapid changes to the Chinese vehicle fleet, including the introduction of more advanced vehicle technologies, a bias against heavier vehicles and an overall more efficient fleet. However it is unclear how

### NOTE ON OUR ANALYSIS

Using 2003 sales data, we analyzed how the standards will affect the following companies: BMW, DC, Ford, GM, Honda, Nissan, PSA, Toyota and VW Group. The Chinese sales data was provided by Automotive Resources Asia, Ltd and we adjusted each company's sales to account for subsidiary ownership (i.e. Ford is attributed 34 percent of Mazda's sales in China). Because the analysis is based on 2003 sales data, it does not include future sales projections or production plans.

However official data for fuel economy or vehicle weight of Chinese vehicles currently does not exist. We were able to determine an American, European, or Japanese model from the same manufacturer that corresponded to each Chinese vehicle model and use its 2002 fuel economy value and vehicle weight in the analysis. Furthermore, we did not account for the type of fuel used by vehicles (i.e. gasoline vs. diesel). The assumption was the all vehicles were operated on gasoline. Finally, because China will be using the EU test cycle to determine fuel economy values we converted all fuel economy data as well as the Chinese weight class standards to this test cycle.

It is important to note that fuel quality issues and differences in parts/vehicle design (especially engine size) for the Chinese market will affect the fuel economy of vehicles driven in China differently than the same vehicles driven in other markets. Likewise, exact vehicle weights in China are likely to differ from those reported in the other markets. For this reason, there are serious limitations to the interpretation of our results. After discussions with Chinese officials, we believe our dataset reflects the best available data at the time of this printing.

1. Chinese Ministry of Communication, December 2003.

2. Energy Information Administration, *International Energy Outlook 2004*. Reference case scenario.

3. National Research Council. *Personal Cars and China*, 2003. Medium GDP growth scenario.

powerful the incentive to produce lighter vehicles will be under the Chinese standards. Currently, the bulk of the sales in the Chinese market are in the medium vehicle segment while nearly half of U.S. sales are in light truck segments. But sales of sport utility vehicles (SUVs) in China are increasing at a high rate, with some projections of up to 25 percent market share by 2007 (up from 10 percent in 2003).<sup>4</sup> In the first half of 2003, 17 new SUV models were introduced to the Chinese market, equal to the number of newly launched cars of all sizes. Although the Chinese standards are designed to be “bottom heavy,” it remains to be seen whether these standards will be sufficient to slow down the rapid growth of SUV’s in the market, a trend that had been expected to continue prior to the standards and may ultimately undermine China’s goals for reducing oil consumption.

Lastly, enforcement of the standards by the Chinese government will be critical to the success of the fuel economy regulations. Because most of the foreign manufacturers in China are likely to face increased costs and market constraints under the new standards, proper enforcement and penalties for non-compliance will be necessary to ensure that new vehicles meet the minimum level of fuel efficiency for their weight class. At this point the Chinese government intends to enforce Phase I (2005) standards, but has not announced specific details on how it will monitor and enforce the more stringent Phase II (2008) standards, leaving the strength of the program in question.

## SCOPE OF THE NEW CHINESE STANDARDS

The new Chinese fuel economy standards for its passenger vehicle fleet are the most stringent efforts to date to regulate the rapidly growing vehicle market in China. These standards are weight-based and will be implemented in two phases (the first in 2005/2006 and the second in 2008), with separate standards for manual and automatic transmissions. Each vehicle sold in China will be required to meet the standard for its weight class. The standards will be classified into 16 weight classes, ranging from 38.0 mpg in 2005 (43.0 mpg in 2008) for the lightest vehicles to 19.0 mpg in 2005 (21.0 mpg 2008) for vehicles weighing over approximately 5,500

lbs.<sup>5</sup> Commercial vehicles and pickup trucks are not regulated under the standards.

In contrast, the U.S. fuel economy standards are based on a two-tier system of cars and light trucks as defined by vehicle specifications (not including weight). Under the Corporate Average Fuel Economy (CAFE) program, each manufacturer is currently required to meet a fleet average of 27.5 mpg for cars and 20.7 mpg for trucks. The standards for trucks will be increasing to 21.0 mpg in 2005, 21.6 in 2006, and 22.2 in 2007, representing a 7 percent increase over three years.

Key differences between the Chinese and U.S. federal approaches include:

- number of vehicle classes
- classification by weight (China) versus type (U.S.)
- minimum thresholds (China) versus class averages (U.S.)
- distinction in China between automatic and manual transmissions

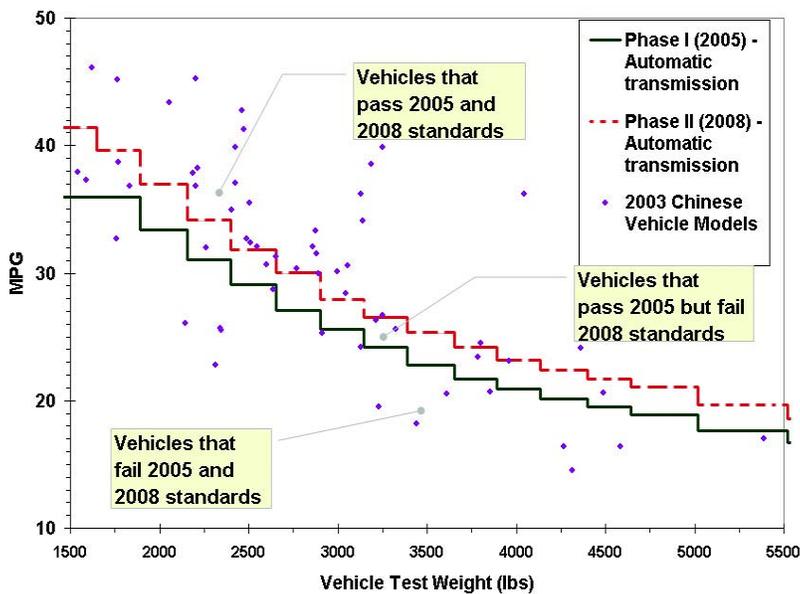
One major difference is that the Chinese standards prescribe a maximum level of fuel consumption for every vehicle within their weight class. This contrasts with the U.S.’s CAFE system that only requires that cars and light trucks meet an average fuel economy of 27.5 mpg and 22.2 mpg (2007) respectively.

Another major difference between the U.S. and Chinese standards is that the Chinese standards are designed to be “bottom heavy”, hence requiring the largest improvements to the heaviest vehicles that are the most inefficient portion of the vehicle fleet. In particular, 66 percent of cars sold in China currently meet the 2005 standards (35 percent in 2008) while only 4 percent of SUV’s and minivans already meet the 2005 standards (while no light trucks currently meet the 2008 standard). As a result, it is possible that the Chinese standards may prevent the development of an auto fleet with a significant penetration of SUV’s and minivans.

Overall, the Chinese fuel economy standards would be slightly more stringent than the current CAFE system in the U.S. Specifically, an increase in the average fuel efficiency of the vehicle fleet of 5 percent for 2005 (and 10 percent by 2008) would be necessary to meet the Chinese standards.

4. Projections from Beijing Jeep, as reported in “The China Daily” August 2003.

5. MPG values converted to the U.S. CAFE test cycle.



**FIGURE 1: 2003 CHINESE MODELS PLOTTED AGAINST THE NEW FUEL ECONOMY STANDARDS**

(includes vehicles from BMW, DC, Ford, GM, Honda, Nissan, PSA, Toyota and VW)

Source: WRI

## IMPLICATIONS FOR FOREIGN AUTOMAKERS IN CHINA

Because foreign automotive manufacturers are selling different types of vehicles in the Chinese market, the new standards will affect companies differently. Currently there is a wide range of vehicles sold in the Chinese market, most of which are above the new standards for their weight class. Figure 1 above shows the 2003 Chinese vehicle fleet plotted against the new Chinese standards. Each point represents one vehicle model. Points below the lower curve are not compliant with the standards. Those above both curves are compliant with the standards, while those between the two curves will meet the Phase I standards in 2005, but are not compliant with the Phase II standards (to be enforced from 2008).

The Chinese fuel economy standards will affect companies differently, creating possible competitive and financial implications for automobile manufacturers with sales in China. Automakers currently are starting from different fuel economy positions and have differing sales volumes in China that would already meet the Chinese Phase I and Phase II fuel economy requirements.

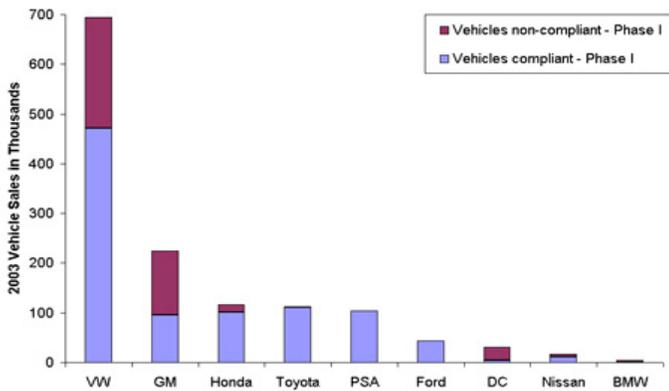
Figure 2a and 2b on the next page indicate the volume of 2003 sales for each company already in compliance to meet the impending Phase I and Phase II standards respectively. For example, 68 percent (or over

470,000 vehicles) of VW's 2003 sales already meet Phase I standards, however only 19 percent (or nearly 130,000 vehicles) currently meet Phase II. On the other hand, PSA's entire 2003 vehicle fleet is already in compliance with both Phase I and Phase II standards. Furthermore there are important differences with respect to the timing of capital expenditures needed to bring fleets into compliance. GM will need to make the majority of fuel economy investments for Phase I. It is noteworthy that 40 percent of GM's sales are from the Buick Regal. However Toyota will incur these costs later, as all of their fuel economy improvements will need to be implemented for Phase II. Overall, these figures give a rough indication of the level and timing of capital expenditures that will be required on the part of companies to bring their fleets into compliance relative to their competitors.

For each manufacturer, the future cost to meet the new standards will be related to the percent of cars sold that are noncompliant and to the degree of improvements necessary to bring those cars into compliance. Figure 3 shows the percent increase in fuel economy each company's fleet will face to meet the Phase I and Phase II standards. For example, GM is likely to face the highest costs in the industry to comply with both Phase I and II standards because its vehicles have to cover the largest gaps in fuel efficiency to become compliant with the new regulations. In contrast PSA, Ford and Toyota are well positioned to meet the Phase I and Phase II standards with little or no improvements to their vehicle's fuel economy.

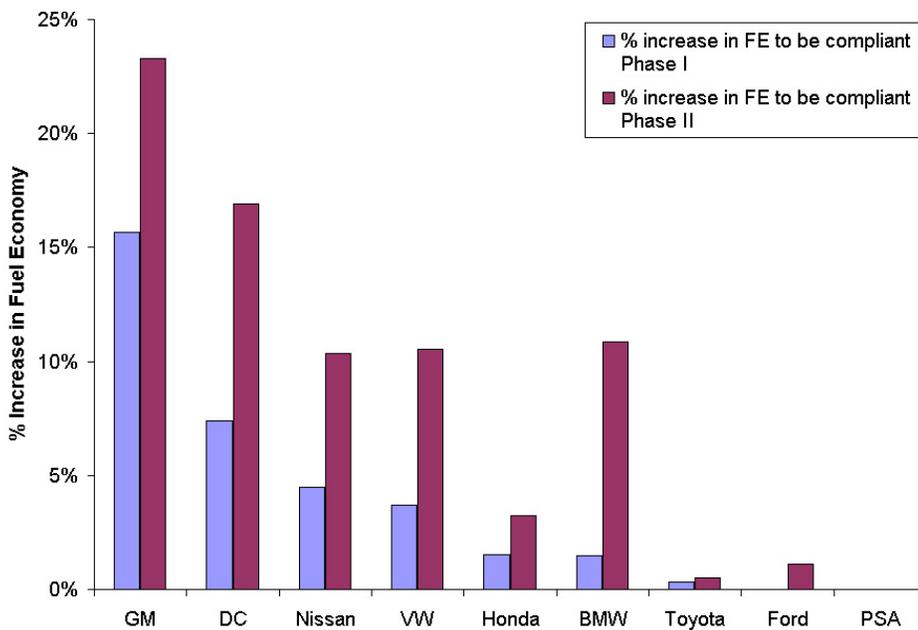
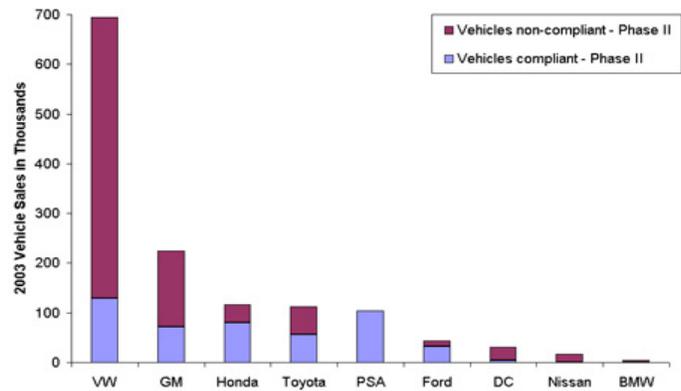
**FIGURE 2A: TOTAL 2003 SALES COMPLIANT AND NONCOMPLIANT WITH PHASE I**

Source: WRI



**FIGURE 2B: TOTAL 2003 SALES COMPLIANT AND NONCOMPLIANT WITH PHASE II**

Source: WRI



**FIGURE 3: PERCENT INCREASE IN FUEL ECONOMY REQUIRED TO MEET CHINESE STANDARDS (BASED ON 2003 SALES)**

Source: WRI

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