

Development of China's Light-Duty Passenger Vehicles Fuel Consumption Standards and Their Implications to Energy Savings

WU Wei and JIN Yuefu, China Automobile Technology and Research Center

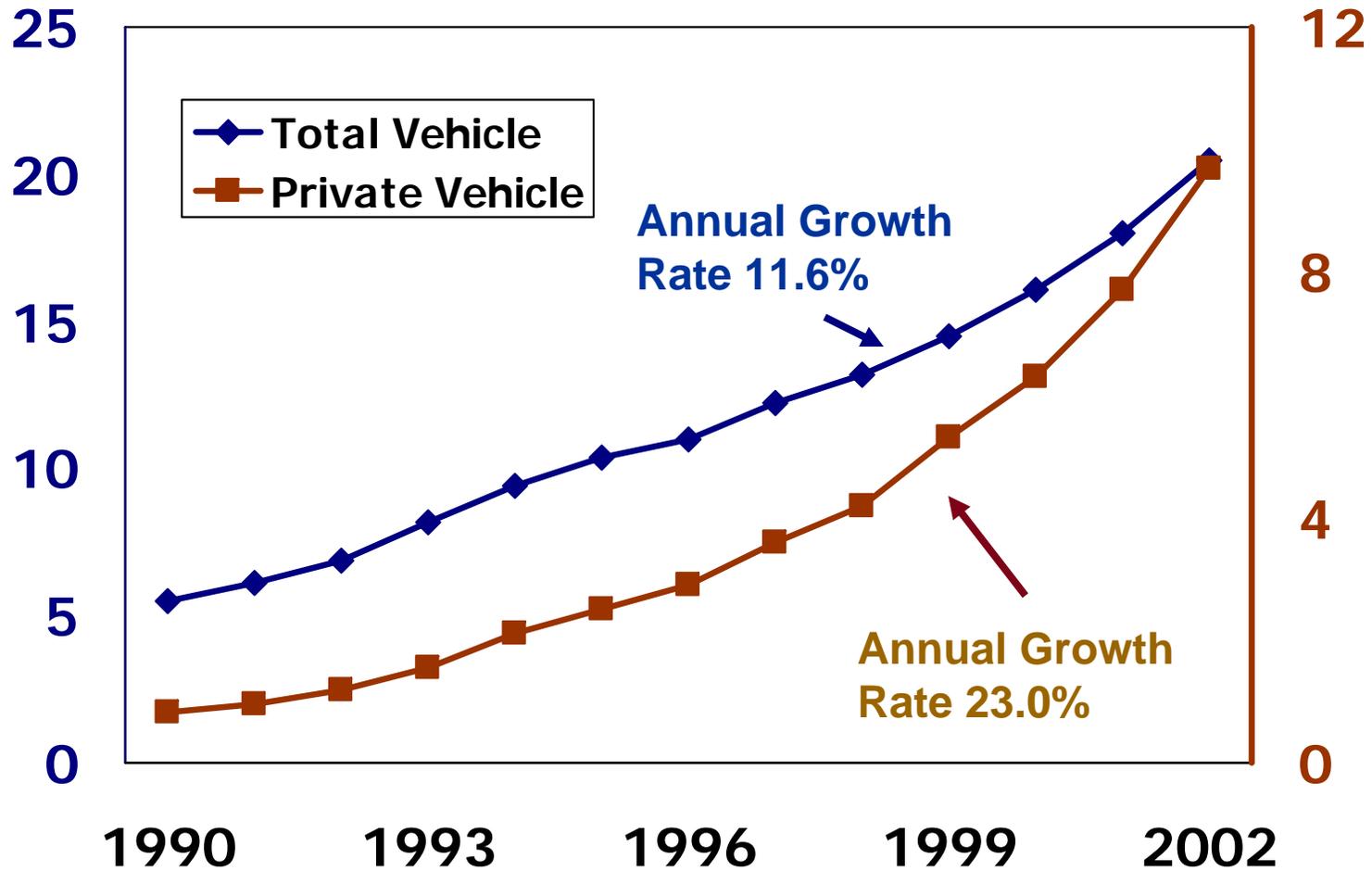
HE Dongquan, The Energy Foundation

Feng An, Consultant

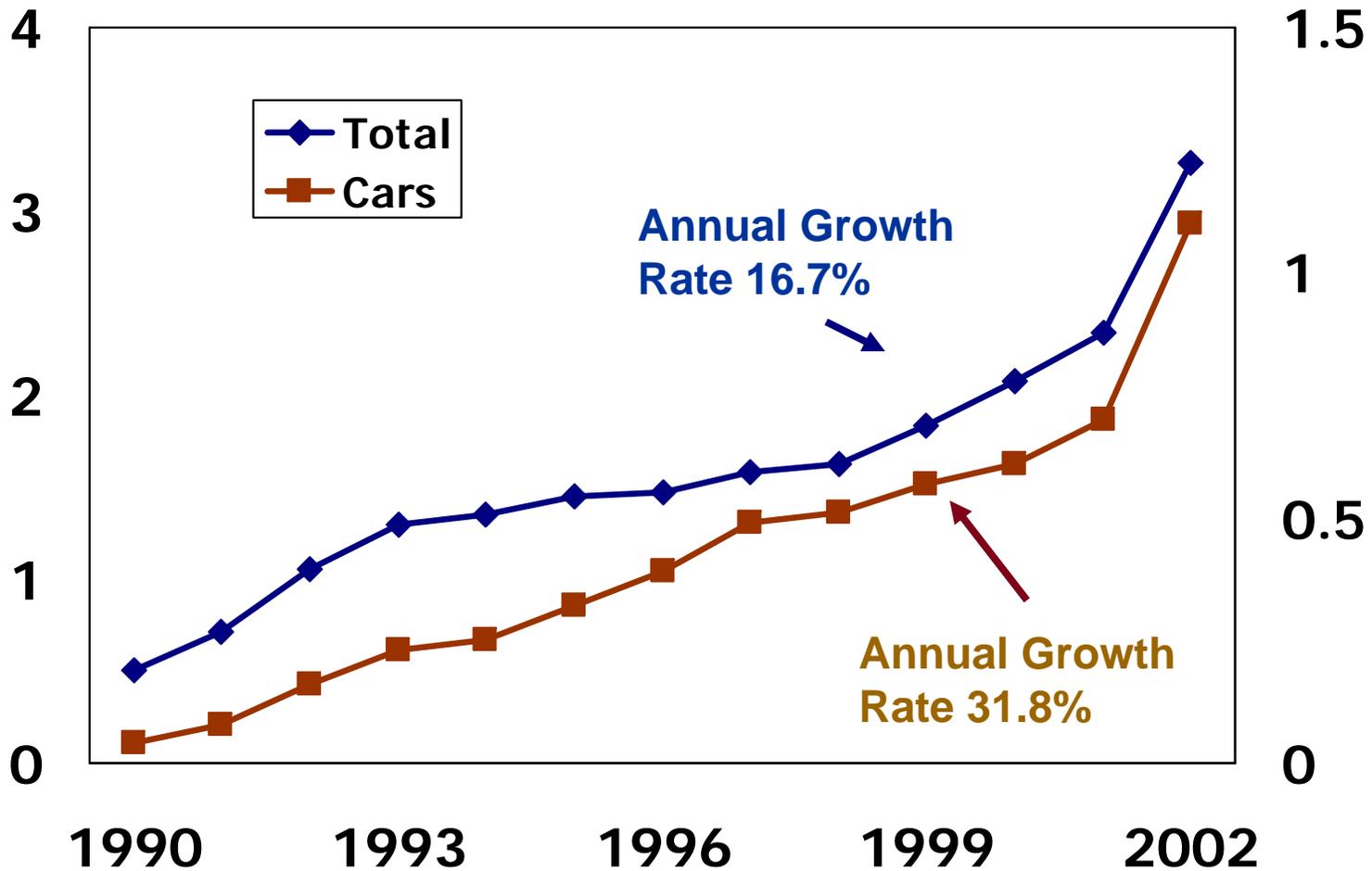
The 2004 Annual TRB Meeting

Washington DC, Jan 12, 2004

Chinese Vehicle Population Growth Has Been Exploding (million)

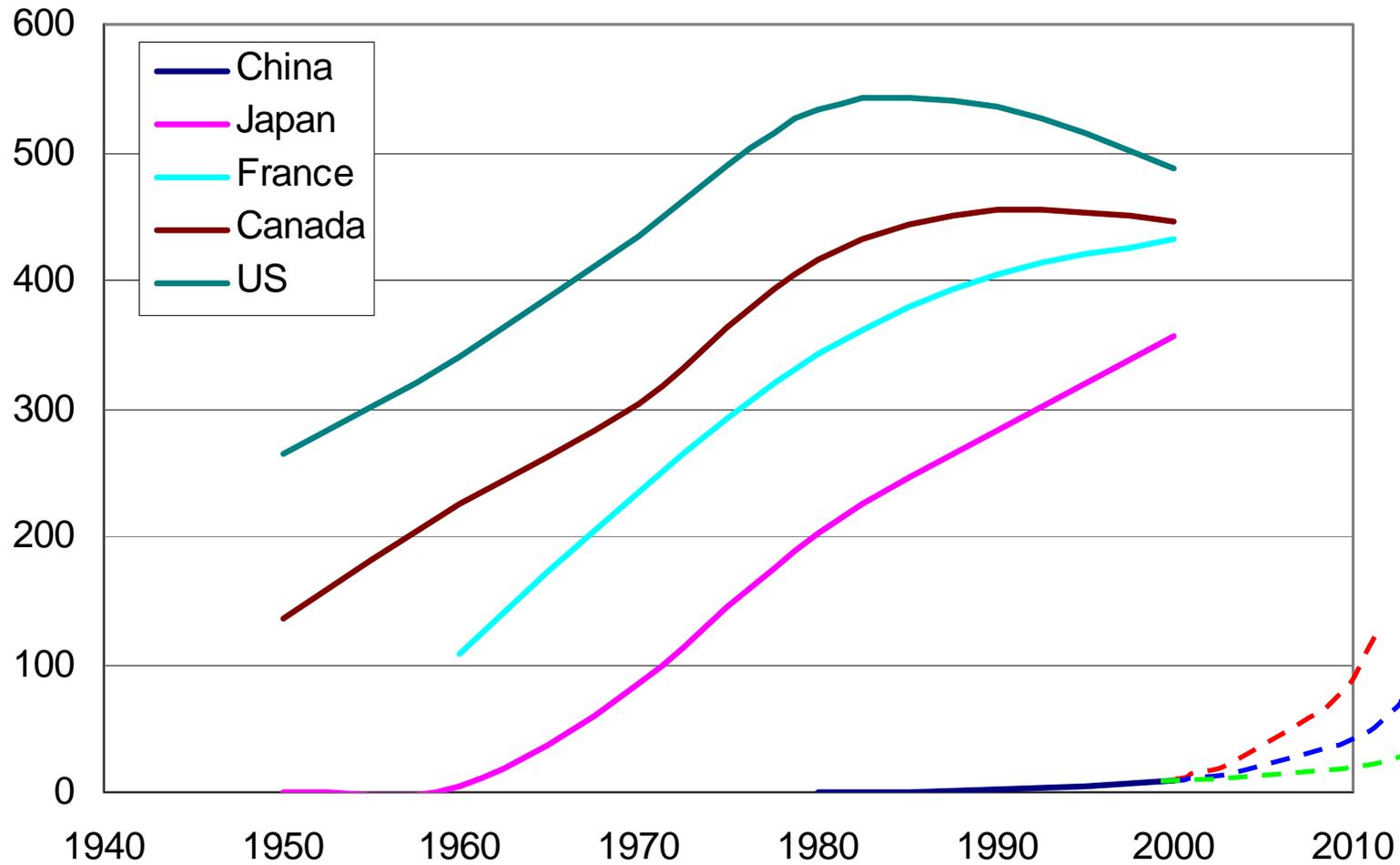


Growth in Annual Vehicle Production Has Been Even Faster (million)

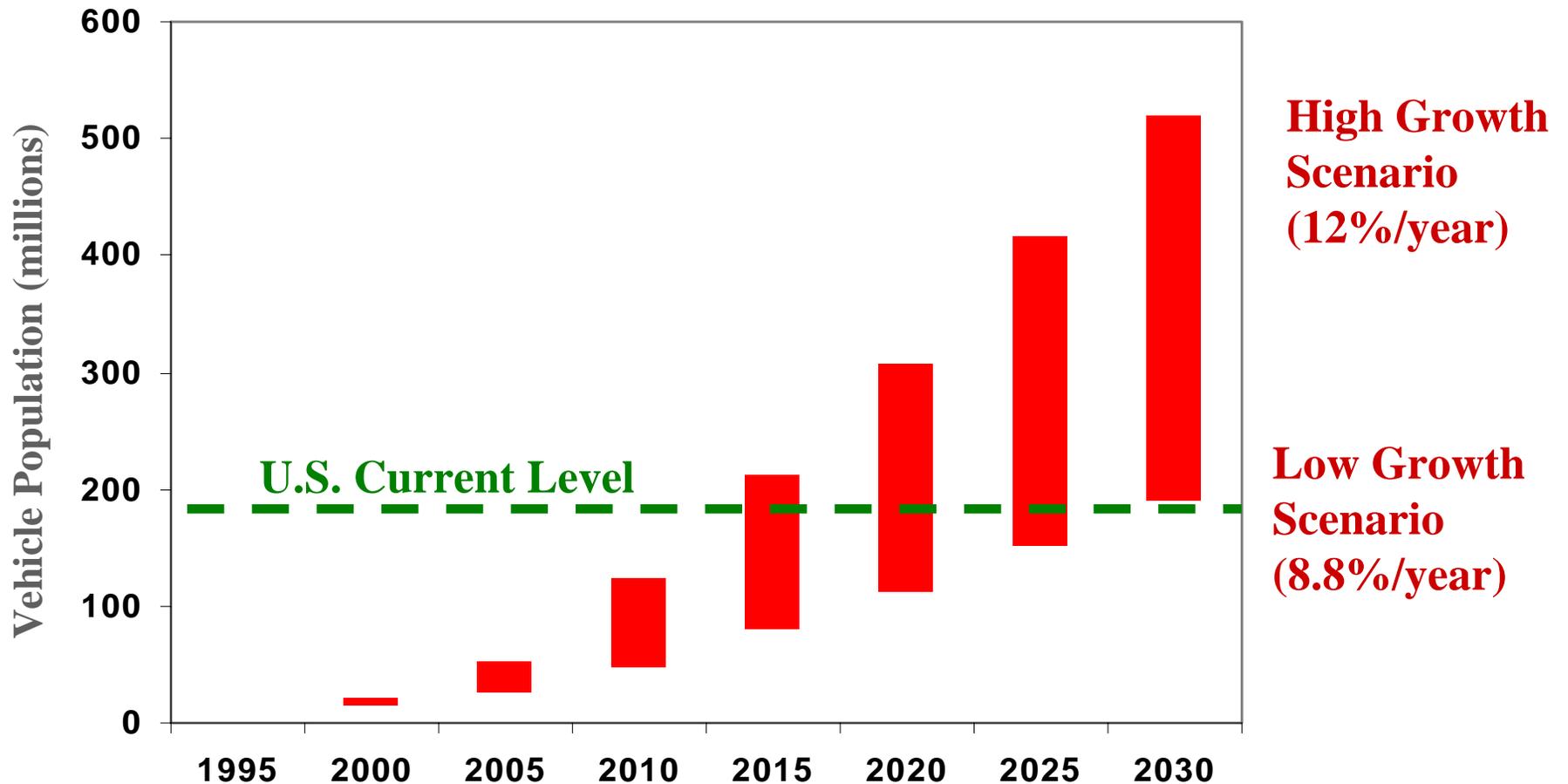


Great Room Exists for Further Chinese Vehicle Growth in the Near Future

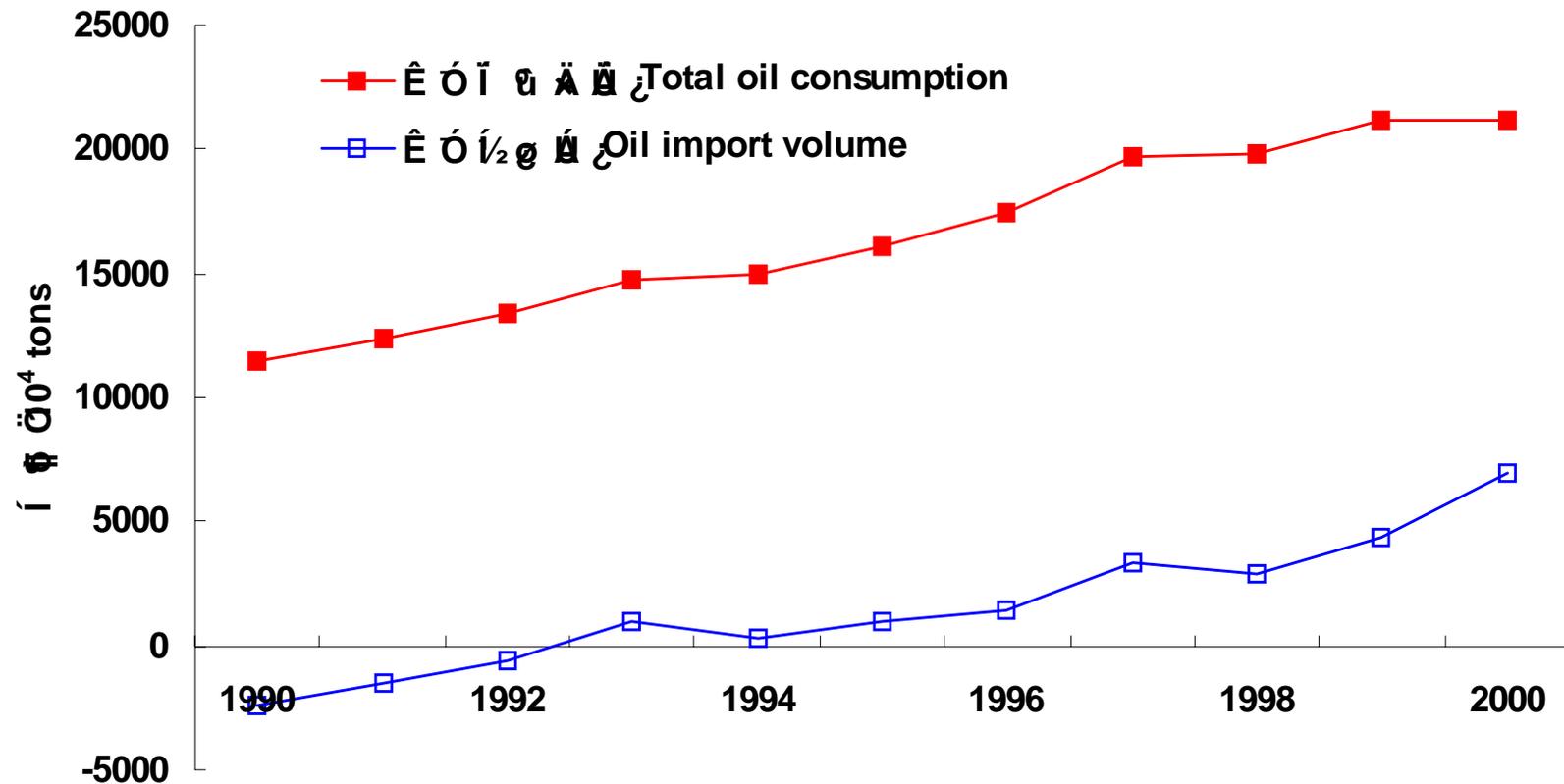
Passenger Vehicle ownership (vehicles/1000 persons)



Chinese Personal Vehicle Population Could Exceed U.S. Population in 15 Years



China Has Increased Oil Use Steadily and Became a Net Importer in 1993



Oil Demand Will Continue to Increase; and >50% Will Rely on Imports by 2010 (Million Metric Tons)

	2000	2010	2020
Oil Demand	224 (1.79)	335 357 (2.68-2.86)	430 520 (3.44-4.16)
Net Import	69 (0.56)	155 187 (1.24-1.50)	240 295 (1.92-2.36)
Percentage of Import	31	46 52	59 62

Red numbers are in Billion Barrels

Chinese Vehicles Are Small, Will There Be an Upward Trend?

	curb wt (kg)	Capacity (cc)	Rated Engine Power (kw)	Transmission	Fuel Consumption (L/100km)
China	1187	1650	72.6	23% AT(A4 A3) 76% MT(M4 M5) 1% CVT	9.1
USA	1472	2900	145	70% AT(A4 A5) 30% MT(M5 M6)	9.7
Germany	1349	1898	97	61% AT(A4 A5) 38% MT(M5 M6) 1% CVT	8.5
Japan	1329	1999	111.2	64% AT(A4 A5) 22% MT(M5 M6) 14% CVT	7.85

Chinese Government's Economic and Energy Targets in 2020

- GDP to be quadrupled from 2000 to 2020
- GDP per capita to exceed \$10K by 2020
- Only to double energy consumption from 2000 to 2020
- To maintain oil imports below 55%
- To control total energy use below 2.9 billion CET
- Three principal policies to achieve these goals
 - Population control
 - Environmental protection
 - Energy conservation

Major Driving Forces for Chinese Vehicle FC Standards

- Reduction in oil import for energy security
- Industry consolidation – currently too many car manufacturers in China, government calls for consolidation to eliminate small, inefficient firms
- Alliance of vehicle regulation system with WTO requirements
- Increase in competitiveness of China's auto industry
- Transfer of better technologies from JVs' foreign partners

Development of Chinese Vehicle Fuel Consumption Standards Began in 2001

- Feasibility study started in 2001
- The first set of standards focuses on light duty passenger vehicles
- *Light Duty Vehicle Fuel Efficiency Test Procedure* was adopted and issued in 2003
- Fuel consumption standards were drafted, approved by the Vehicle Standardization Committee, and submitted to government for final adoption

Main Features of Chinese Vehicle Fuel Consumption Standards

- M1 (EU classification) vehicles, including passenger cars, SUVs and MPVs with less than 9 seats
- Two different sets of standards for:
 - Passenger cars with manual transmission
 - Passenger cars with AT, SUVs, and MPVs with 3+ rows

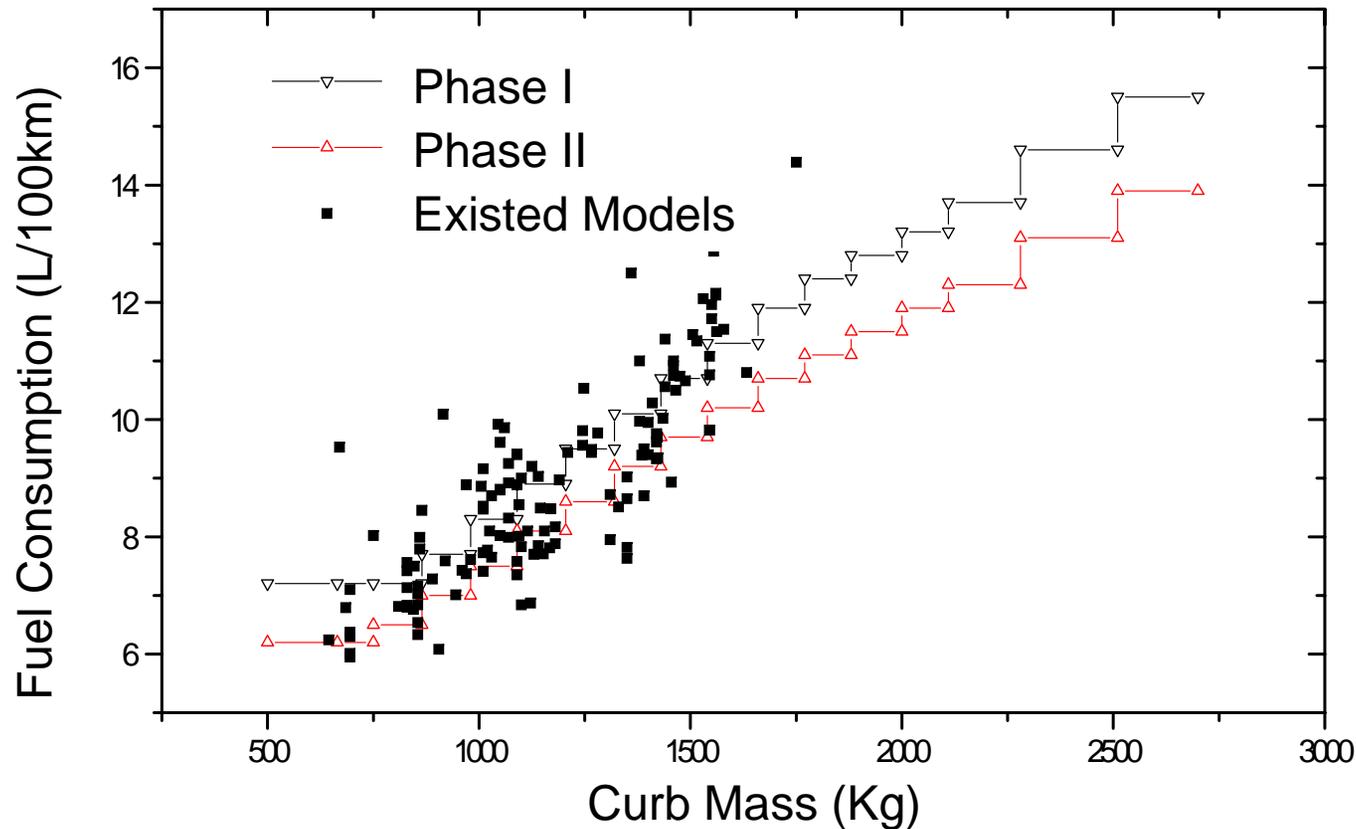
Main Features of Chinese Vehicle Fuel Consumption Standards (Continued)

- Weight-based standards with 16 weight classes
- Under the New European Driving Cycle (NEDC)
- In Liters/100 km, thus, they are fuel consumption standards
- A maximum fuel consumption level to be met by individual vehicles within a class instead of an average value for the class

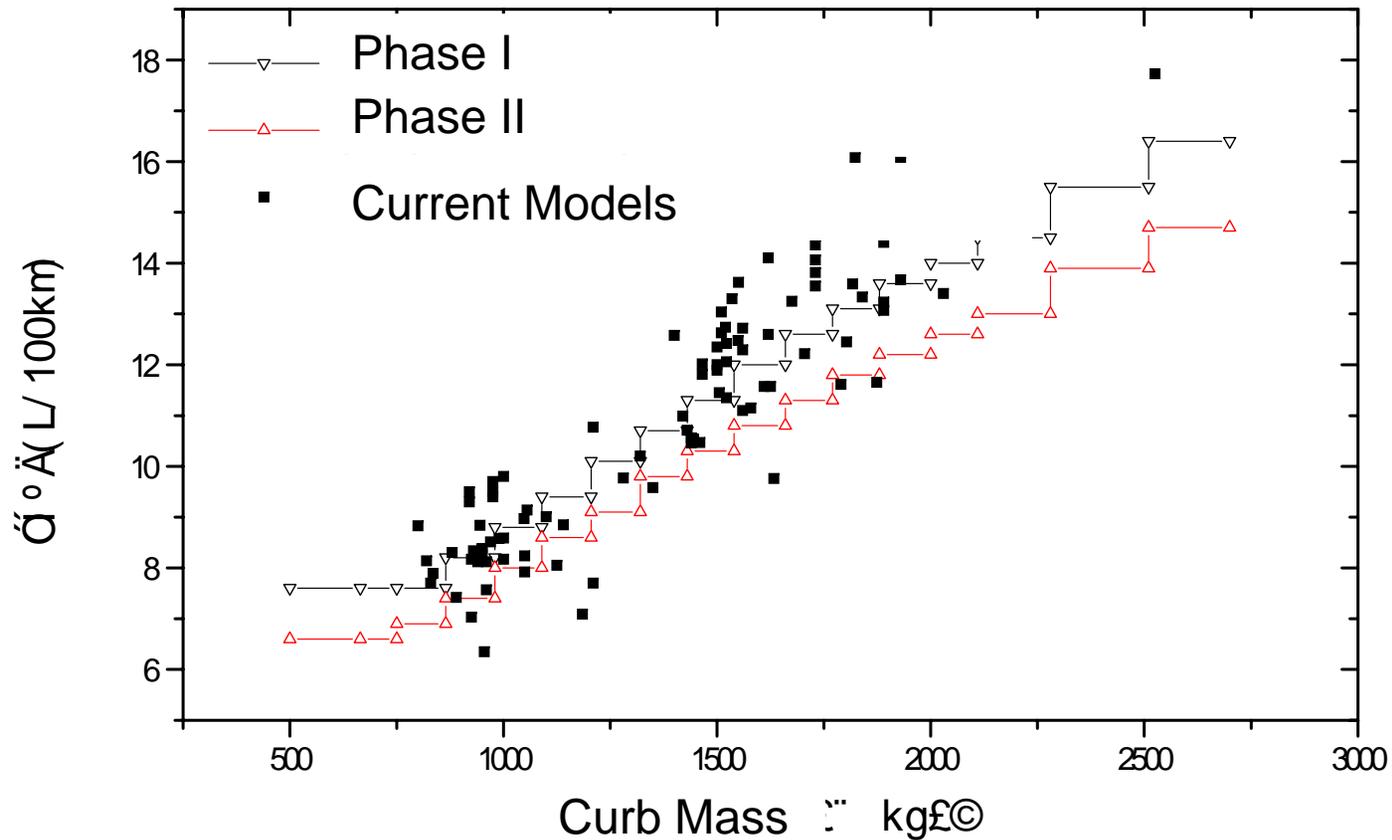
Fuel Consumption Standards – MT Cars

Phase I will be effective in July 2005

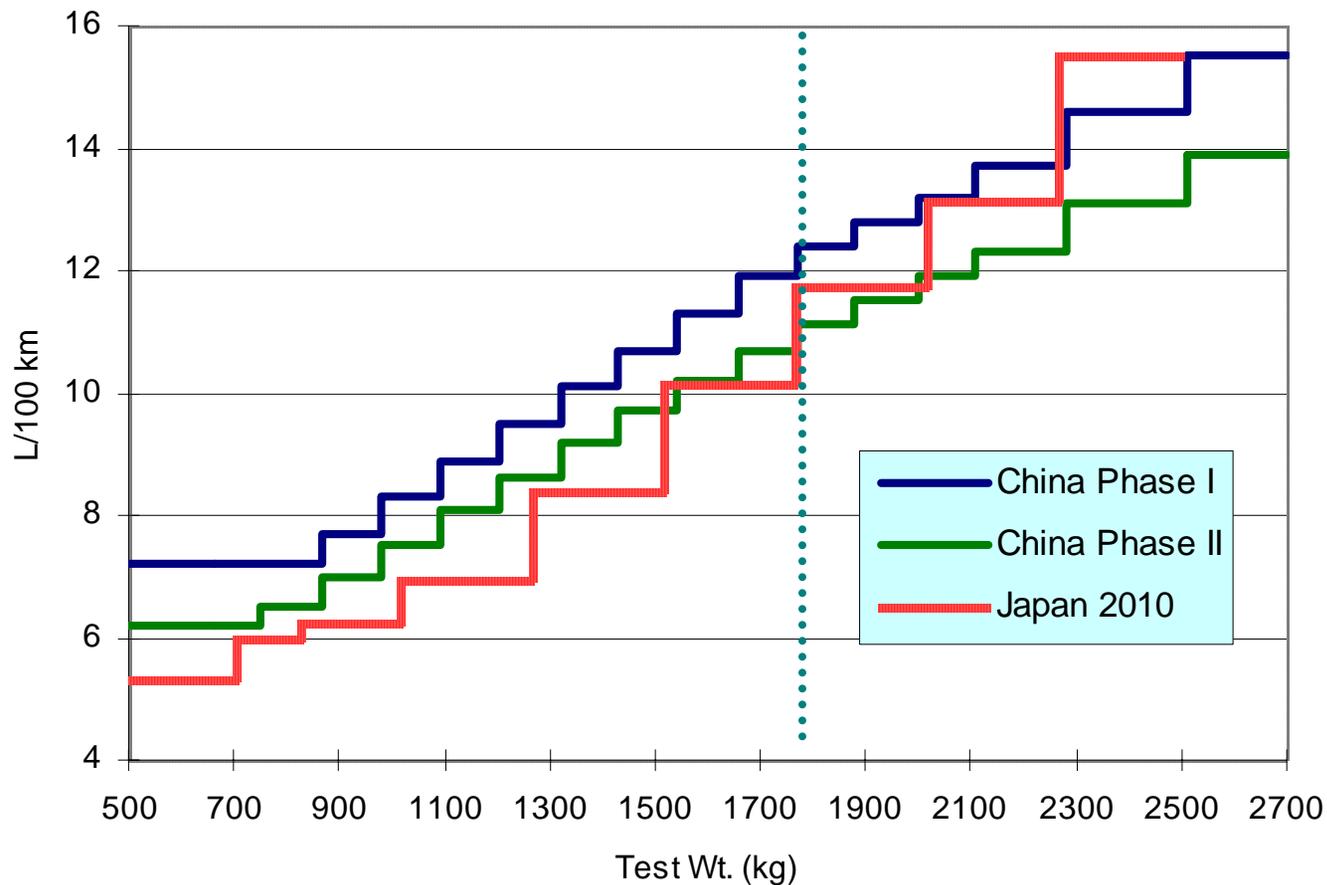
Phase II will be effective in July 2008



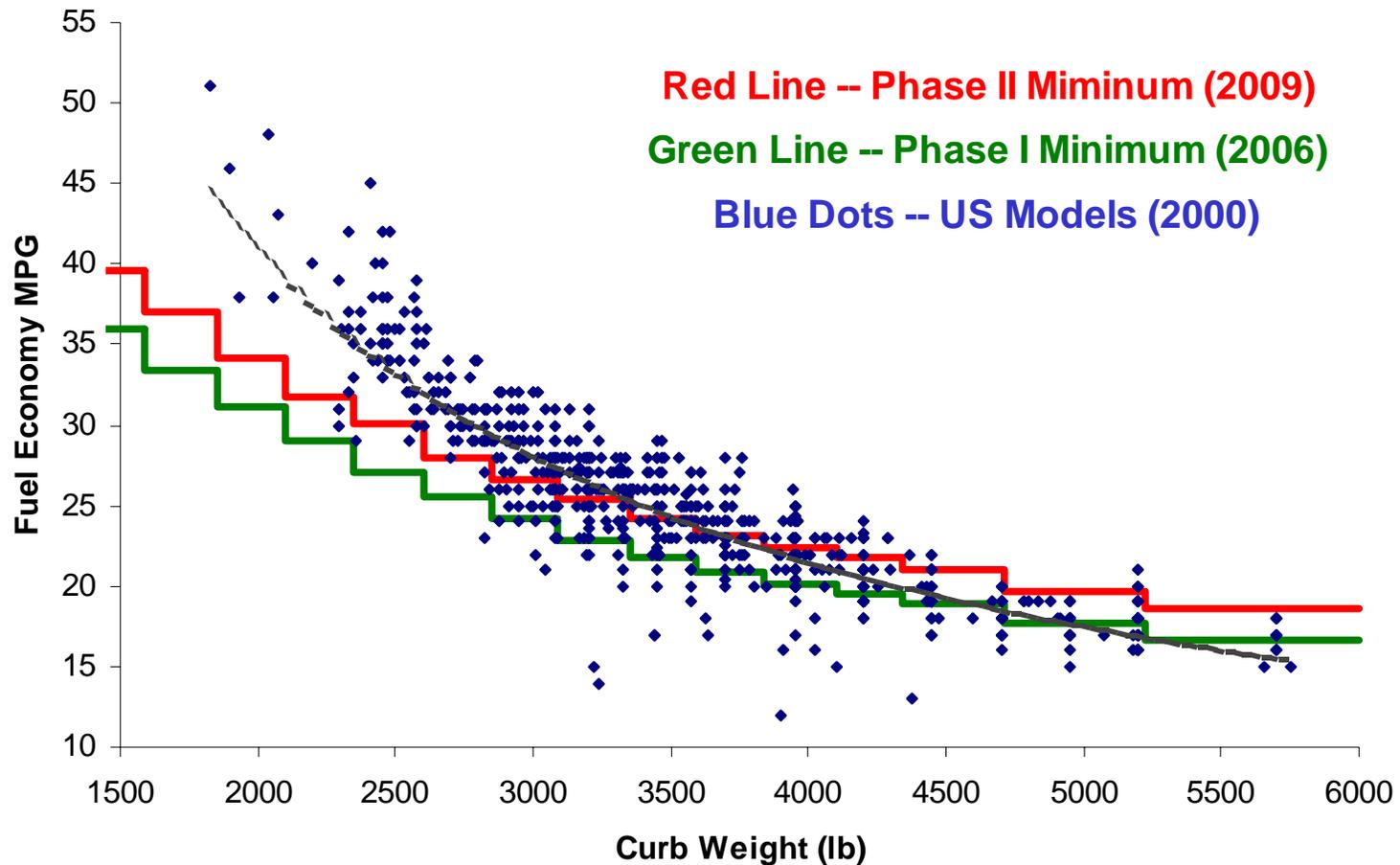
Fuel Consumption Standards – AT Cars, SUVs, and 3+ Rows Passenger Vehicles



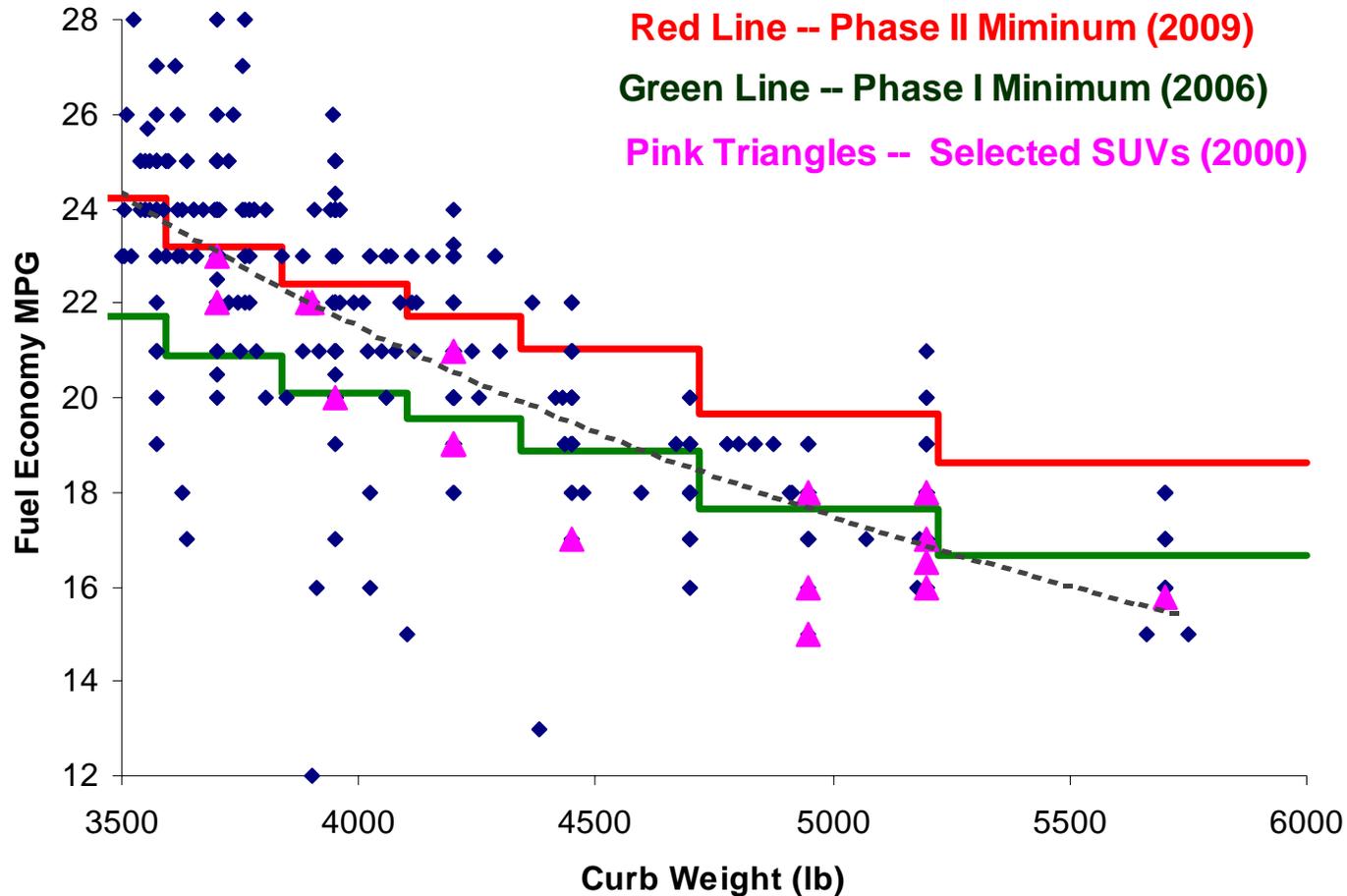
China vs. Japan – Loose for Light-Weight But Strict for Heavy-Weight Classes



China vs. U.S. – Loose for Light Models But Tough for Heavy Models (SUVs)

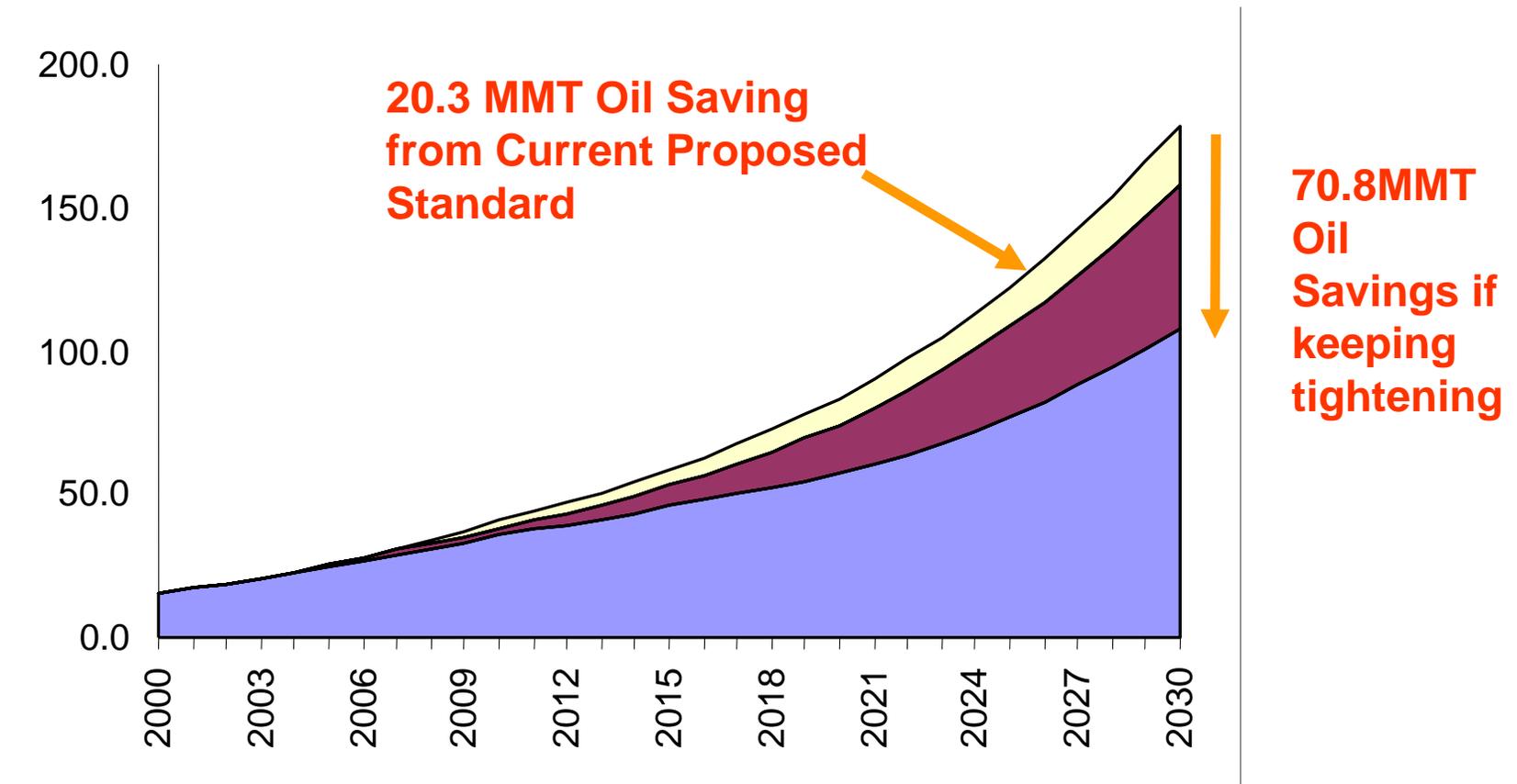


Chinese Standards Are Stringent for SUVs



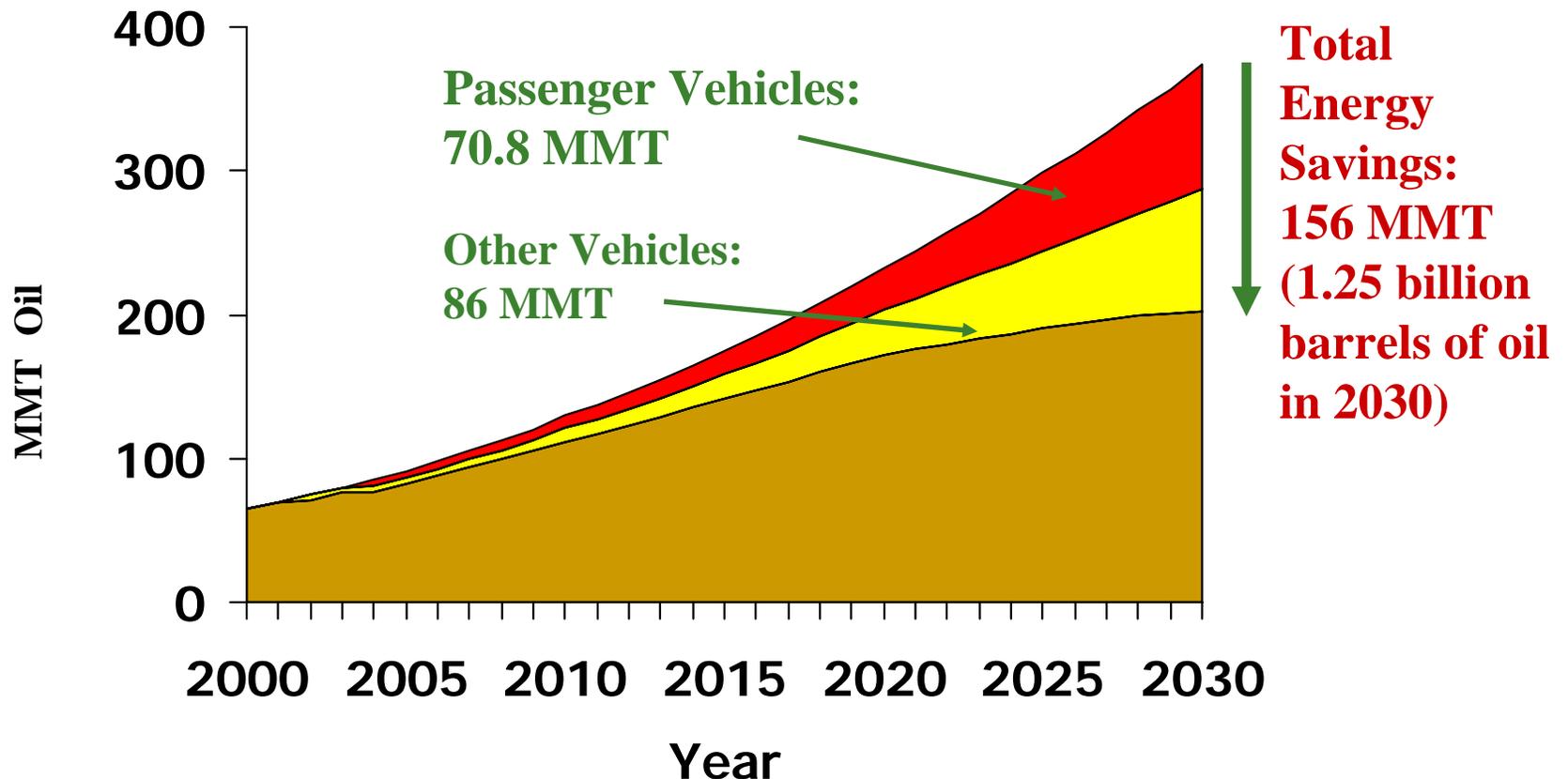
Oil Saving Potentials of the Standards

Oil Reduction Potential from Light-Duty Passenger Vehicles (MMT)



Oil Saving Potentials of the Standards

Fuel Consumption Reduction Potential from Whole Vehicle Fleet



Next Steps

➤ Enforcements

- Get the standards into the existing vehicle certification system
- Ban production of or apply economic fines to non-compliance vehicles
- Report and Publish dates and values of fuel efficiency standards
- Offer consumer incentives: tax reductions for better fuel economy vehicles

➤ Fuel consumption standards to be studied and proposed for other vehicle types

- Light Duty Trucks
- Heavy Duty Vehicles
- Motorcycles

Acknowledgement

- **Great Efforts from various organizations and individuals**
 - **National Development and Reform Commission (NDRC)**
 - Department of Industry
 - Department of Industry Policy
 - Department of Environment and Energy Comprehensive Utilization
 - Energy Bureau
 - **Standardization Administration of China (SAC)**
 - **China Automotive Technology and Research Center**
 - Wu Wei, Jin Yuefu, Xu Bamin, Gao Haiyang, Zhang Jinhua
 - **Tsinghua University and the State Council Development Research Center**
 - He Kebin, Feng Fei, Huo Hong, Zhang Qiang
 - **International Consultants**
 - Michael Walsh, Michael Wang, Feng An
 - **International Organizations**
 - The Hewlett and Packard Foundation: Hal Harvey, Jim Leape
 - The Energy Foundation: Charlotte Pera, Doug Ogden, Fuqiang Yang