

---

# Vehicle Fuel Efficiency in China

Huiming GONG  
Transportation Program, The Energy Foundation

---

Mar. 24-25, 2009 Singapore



中国可持续能源项目  
The China Sustainable Energy Program

## Outline

---

- **About EF and CSEP**
- **Background**
- **What China does and the impacts**
- **Challenges**



## About EF and CSEP

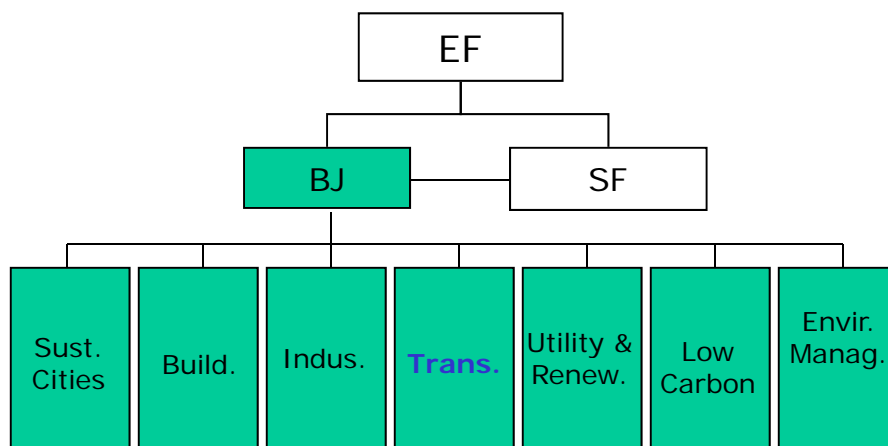
---

- **NGO**
- **1991 registered in San Francisco, US**
- **1999 started working in China, China Sustainable Energy Program (CSEP)**



## China Sustainable Energy Program

---



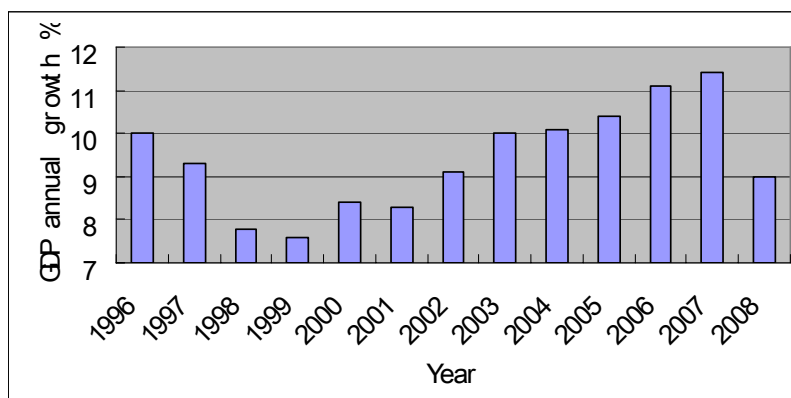
## How CSEP works

- Mission: advance energy efficiency and renewable energy
- Assist national and local governments with policy development and implementation
- Transportation Program Goals: reduce carbon emissions, slacken fuel consumption growth, and improve air quality from the transportation sector



## China's GDP is increasing fast

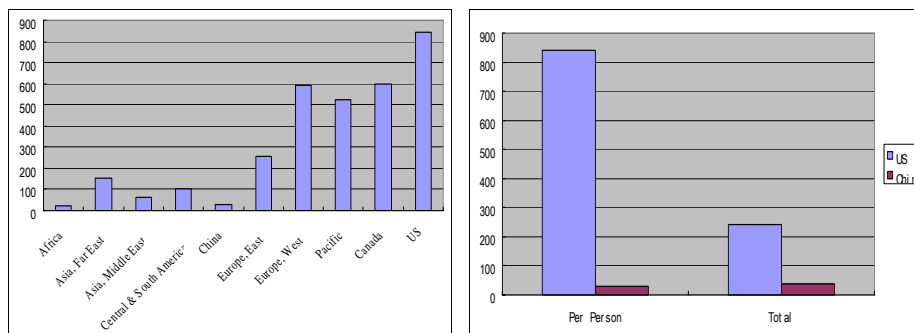
No. 4 globally & will catch up U.S. by 2030?



## Small Vehicle Population in China

Categories	Population
Cars\Buses\ Trucks <i>(Passenger vehicles \ Commercial vehicles)</i>	49.8 million (24.4/19.5)
Motorcycles	89.5 million
Rural Vehicles <i>(3-wheel vehicles &amp; low speed cargo vehicles)</i>	14.9 million
Tractors	14.6 million

## Vehicle Ownership

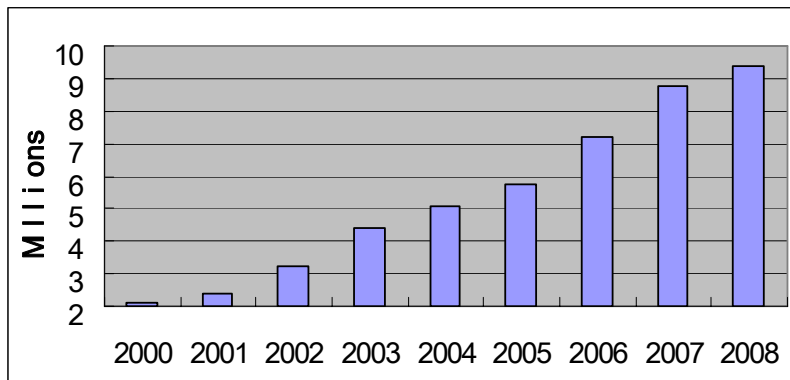


Beijing: 2.87 million, 180 vehicles per one thousand in 2006  
 Shanghai: 2.13 million, 120 vehicles per one thousand

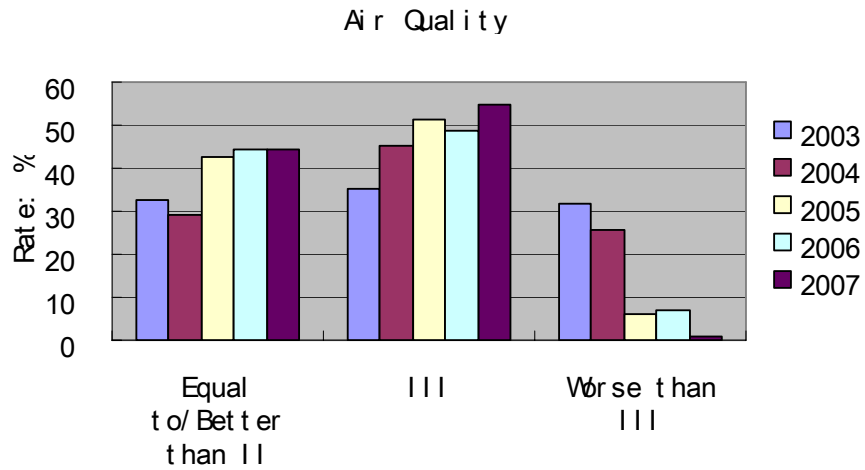


## New Vehicle Sales Are Booming

- 20% annual increase in average since 2000
- China could be the largest new vehicle market by 2015

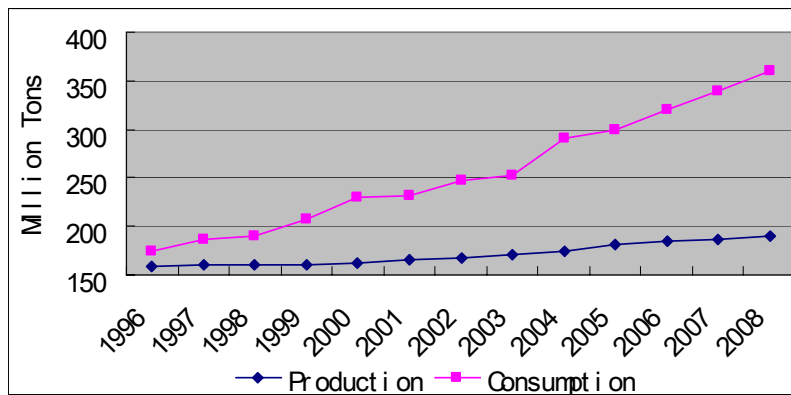


# Urban Air Quality



# Crude oil import keeps increasing

- 52% oil import dependence
- Transportation accounts for ~ 30%



# Big Technology Gaps

- **Fuel Efficiency**

Europe 5.6L/100km by 2012

Japan 5.9L/100km by 2015

China 8L/100km by 2009 (30% & 7.5%; 26% & 4%)

- **Emissions**

- **Fuel Quality (sulfur content)**

US 15ppm, Europe 10ppm, Japan 10ppm

China: gasoline 500ppm, diesel 2000ppm

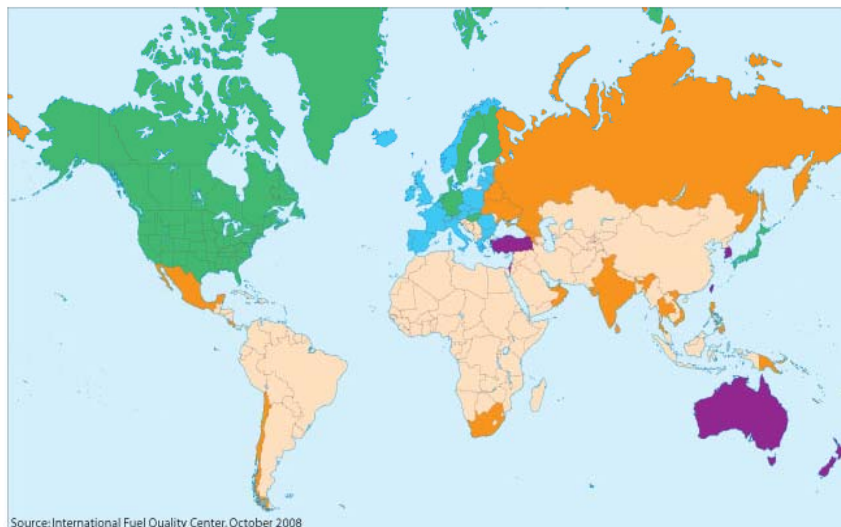
- **Road safety**

41,000 dead and 2.49 million injured in 2007 in US

82,000 dead and 380,000 injured in 2007 in China



Diesel Sulfur Limits



10 or 15 ppm    10 & 50 ppm    50 ppm    300 - 500 ppm    1,000 - 12,000 ppm

Note: Where available/applicable, sulfur levels are based on early implementation of lower sulfur diesel.



## **Adopted Fuel Economy Standards**

<b>Standards</b>	<b>Implementation Date</b>
PC Phase I, II	2005.7.1 / 2006.7.1 2008.1.1 / 2009.1.1
LD commercial vehicle Phase I, II	2008.2.1 2009.1.1 / 2012.1.1
Motorcycle	2009.7.1
Rural vehicle Phase I	2008.6.1



## **Passenger Car FE Standards**

- **China's first mandatory vehicle fuel economy standard (2004)**
- **16 classes based on weight**
- **Comparatively more stringent against heavy vehicles**
- **Phase I – July 1st, 2005 (2006)**  
**Phase II – Jan. 1st, 2008 (2009)**

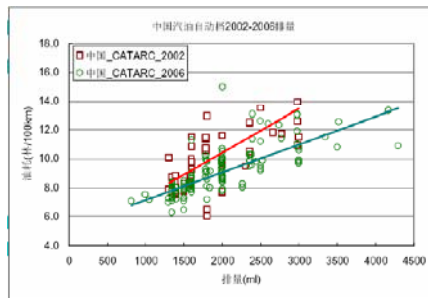
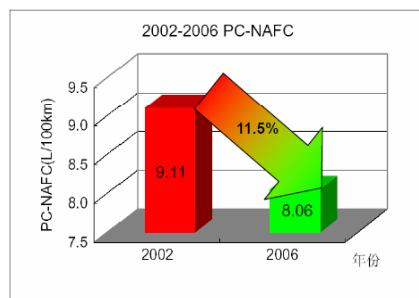


## 76% of models already meet phase II

	Phase I	Phase II
<b>300 models in 2003</b>	<b>~50%</b>	<b>~12%</b>
<b>417 models after 2005</b>	<b>100%</b>	<b>76.3%</b>
<b>845 models total</b>	<b>84%</b>	<b>53%</b>



## Impacts Analysis of PC FE Standards

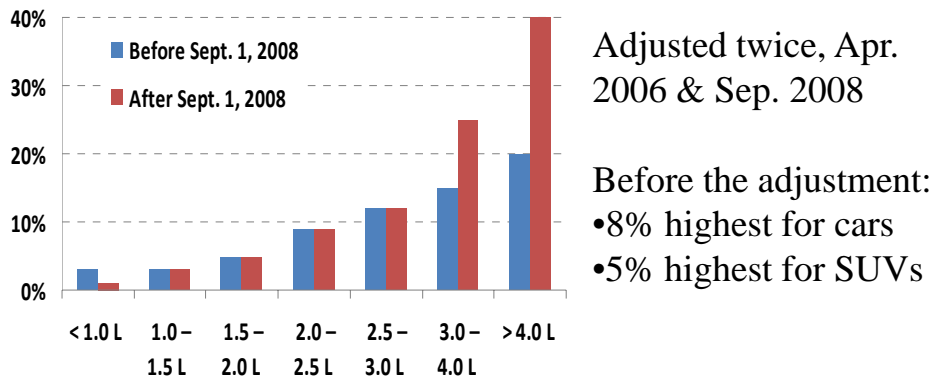


➤ From 2003 to 2006, 1.18 million tons of gasoline was saved and 3.7 million tons of CO<sub>2</sub> was reduced

➤ Poor technologies and products were discouraged; more than 400 models were banned



## Vehicle Excise Tax



## Fuel Tax

- **Since Jan. 1<sup>st</sup>, 2009**
- **Gasoline**  
0.2 RMB/L increased to 1 RMB/L
- **Diesel**  
0.1 RMB/L increased to 0.8 RMB/L



## **Others in Progress**

---

- **Phase III of passenger car**
- **Medium- & heavy-duty commercial vehicles**
- **Fuel efficiency labeling**



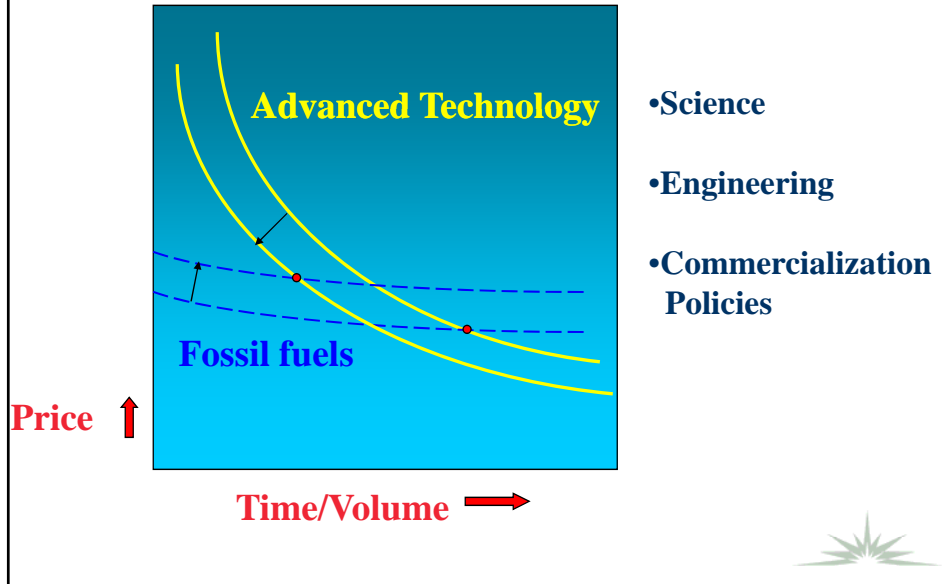
## **New Trends**

---

- **Catch up the international best practice by 2020 ?**
- **FE standard together with fiscal policies ?**
- **CAFÉ and NAFE ?**



## Technology Policies Catalyze Markets



## Ten-City 1,000-Vehicle Program



- At least 1,000 new energy vehicles in each of 13 cities, i.e. Beijing, Shanghai, Chongqing, Changchun, Dalian, Jinan, Hefei, Hangzhou, Changsha, Wuhan, Nanchang, Kunming, & Shenzhen
- At least three-years program
- Government associated vehicles, e.g. taxi & bus

# Fiscal Incentives to ATV

## Passenger vehicles & light-duty commercial vehicles (10,000RMB)

## Bus longer than ten meters (10,000 RMB)

Category	Fuel Saving: %	Maximum power of electric motor / (Maximum power of electric motor + rated power of engine): %				Category	Fuel saving %	Lead acid battery	Nickel hydrate, Lion-ion, ultra-capacitor	
		BSG	10-20	20-30	30-100				Electric power ratio 20%-50%	Electric power ratio Above 50%
HEV	5-10	0.4	---	---	---	HEV	10-20	5	20	---
	10-20		2.8	3.2	---					
	20-30	---	3.2	3.6	4.2					
	30-40	---	---	4.2	4.5					
	> 40	---	---	---	5.0					
EV	100	---	---	---	6.0	EV	100	---	---	50
FCV	100	---	---	---	25.0	FCV	100	---	---	60

# Auto Industry Renovation Plan

- **5% purchase tax for passenger vehicles smaller than 1.6L**
- **5 billion RMB subsidy for rural vehicles replacement with LDT and mini-bus smaller than 1.3L**
- **10 billion RMB for technology R&D**
- **Promote ATV pilots**
- **Encourage merge and reform**

# Challenges

---

- **Poor fuel quality**
- **Emissions vs. efficiency**
- **Government reform**
- **Growing powerful auto industry**



# Thank you!

---

**[gonghuiming@efchina.org](mailto:gonghuiming@efchina.org)**

**The Energy Foundation (EF)**

**[www.efchina.org](http://www.efchina.org)**

