China’s fuel economy regulations and their effects on Chinese auto industry

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Outline

- iCET Introduction
- China Fuel Economy Standards and Policies
- International Comparisons
- CAFC Trends and Industry Analysis
- Roles of New Energy Vehicles
- Conclusions
An independent, non-profit, policy think-tank registered in California and Beijing, China.

Mission: to provide decision makers at all level with urgently needed innovative solutions to solve the energy and climate crises.

Current Focuses:
- Clean Transportation Program (CTP)
- Carbon Management (CM)
- Clean Technology Development (US-China Clean Tech Center)

Major achievements - helped China to establish:
- The First National Fuel Economy Standards for Cars and Trucks
- The First online China Climate Registry System for enterprises to report carbon footprint
- The First Sustainable and Low Carbon Fuel Evaluation Standards
- The US-China Clean Tech Center
The Problem

Oil Dependency
- China is projected to become the world’s largest importer in 2014.
- The share of China’s oil imports accounts for over 60% of the national consumption and is increasing steadily. The transport sector is responsible for over 70% of the increase in oil demand.

GHG Emissions
- China’s transport sector is projected to increase national CO2 emissions by over 50% between 2010 and 2020.

Local Pollution
- China’s transport sector is responsible for about 50% of city air pollution. Beijing government states that the transport sector accounts for 22% of city PM2.5.

The Opportunity

As the world’s largest and fastest growing auto market, China’s shift towards cleaner means and sources of transportation has the potential of shaping our future mobility.
China Fuel Economy Regulations
Last year, China’s imported cars amounted to 1.171 million vehicles, an annual increase of 7.3% and accounting for 6.5% of 2013 annual new car sales. Interestingly, small cars importation has increased, which is illustrated by 2.2% reduction in average vehicle weight. Yet, the majority of imported cars are still mainly luxury and sports utility vehicles (SUVs), which accounts for 61.9% of the market.

China's passenger vehicle production and sales reached over 18 million units in 2013, which marked China’s fifth consecutive year as the world's biggest auto market with an increase of 16.5%.
Revolve of China Fuel Economy Standards

- Phase I MT Limits
- Phase II and III MT Limits
- Phase III MT Targets and Phase IV DRAFT Limits
- Phase IV DRAFT Targets
- Phase I AT Limits
- Phase II and III AT Limits
- Phase III AT Targets and Phase IV DRAFT =>3 rows Limits
- Phase IV DRAFT >=3 Rows Targets

30% reduction goal
2006-2013 Corporate Average Fuel Consumption Reduced 10.2%, with annual reduction rate of 2.3%
Progresses are being made, but not as fast as they should and could be!
China’s Top-10 selling vehicle models are about same size of the EU and Japanese models in term weight and body size, but have higher fuel consumption rates.
China vehicle standards are much weaker than EU’s

China 2011 Actual and 2015 Targets vs EU 2015-2020 CO2 Standard for Cars

\[
y = 0.1052x + 39.305 \\
R^2 = 0.6767
\]

\[
y = 0.0824x + 61.914 \\
R^2 = 0.9691
\]
China vehicle standards also weaker than US
Phase IV target will be far more challenging!
Phase IV Schedule, from slow start to very tough!

<table>
<thead>
<tr>
<th>Year</th>
<th>CAFC/ T&lt;sub&gt;CAFC2020&lt;/sub&gt;</th>
<th>Annual CAFC Reduction</th>
<th>CAFC L/100km</th>
<th>L/100km</th>
<th>Relative Annual FC Reduction (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>144%</td>
<td>5</td>
<td>7.22</td>
<td>0.16</td>
<td>-2.1%</td>
</tr>
<tr>
<td>2014</td>
<td>141%</td>
<td>3</td>
<td>7.06</td>
<td>0.16</td>
<td>-2.2%</td>
</tr>
<tr>
<td>2015</td>
<td>138%</td>
<td>3</td>
<td>6.90</td>
<td>0.16</td>
<td>-2.3%</td>
</tr>
<tr>
<td>2016</td>
<td>134%</td>
<td>4</td>
<td>6.70</td>
<td>0.20</td>
<td>-2.9%</td>
</tr>
<tr>
<td>2017</td>
<td>128%</td>
<td>6</td>
<td>6.40</td>
<td>0.30</td>
<td>-4.5%</td>
</tr>
<tr>
<td>2018</td>
<td>120%</td>
<td>8</td>
<td>6.00</td>
<td>0.40</td>
<td>-6.3%</td>
</tr>
<tr>
<td>2019</td>
<td>110%</td>
<td>10</td>
<td>5.50</td>
<td>0.50</td>
<td>-8.3%</td>
</tr>
<tr>
<td>2020</td>
<td>100%</td>
<td>10</td>
<td>5.00</td>
<td>0.50</td>
<td>-9.1%</td>
</tr>
</tbody>
</table>

2016-2020 CAFC Annual Average Reduction: -6.2%

2014-2020 CAFC Annual Average Reduction: -5.1%
However, New Energy Vehicles could come to rescue, contributing up to 25% towards the target.
ICE vehicles fuel consumption reduction towards Phase IV CAFC target should NEVs production targets be met and off-cycle technologies fully implemented.

“off-cycle” energy-saving technologies such as tire pressure monitoring systems, efficient air conditioning, idle start-stop system, and shift reminder.
China Automaker Corporate Average Fuel Consumption Trend Report (2006-2012)
2013 Corporate Average Fuel Consumption Rate is 7.22 L/100km, 2.1% reduction from 2012 level

1. 79 brands (33 JVs, 46 Domestic)
2. 25 imports
3. 10 auto groups
Most large manufacturers are faced with 4.3-5.8L/100km requirement in the Phase IV draft (T_{CAFC2020}), with their current fuel consumption level about 144% of the 2020 target (CAFC_{2013}/T_{CAFC2020}) on average.
China’s 2013 Importing Brands’ CAFC Values

Importing Brands Average CAFC = 9.05 L/100km
Importing manufacturers’ 2020 Target Gaps are more challenging

Imported manufacturers are facing a target of 5.93L/100km in 2020 ($T_{CAFC2020}$) and are currently meeting 155% of that target ($CAFC_{2013}/T_{CAFC2020}$), requiring steep improvements in the future.

Average $CAFC/T_{CAFC2020}$ is 154%
China’s Top 10 passenger car JVs account for the production of 9.4 million cars and captures 55% of China’s vehicle market, were: Shanghai Volkswagen, FAW-Volkswagen, GM-Wuling, Beijing Hyundai, Nissan, Ford, Shanghai GM, Dongfeng Shenlong, DYK, Shanghai GM Dong Yue.

Laeading JVs  Average CAFC =7.31 L/100km
China 2013 Top 10 JVs CAFC vs. their 2020 Target

Leading JVs Average CAFC_{2013}/TCAFC_{2020} = 144%
A Global Comparison of Average Annual FC Reduction Standard Requirement

<table>
<thead>
<tr>
<th>Country</th>
<th>Period</th>
<th>Annual CAFC Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>(2015-2020)</td>
<td>6.2%</td>
</tr>
<tr>
<td>US</td>
<td>(2017-2025)</td>
<td>5.3%</td>
</tr>
<tr>
<td>California</td>
<td>(2017-2025)</td>
<td>5.3%</td>
</tr>
<tr>
<td>EU</td>
<td>(2015-2020)</td>
<td>6.1%</td>
</tr>
<tr>
<td>Japan</td>
<td>(2015-2020)</td>
<td>3.5%</td>
</tr>
</tbody>
</table>
Conclusions

1. Most of today’s vehicle models meet China’s 2015 Phase III target.
2. China’s average corporate average fuel consumption reached its annual target, indicating corporate 2015 targets could be easily met.
3. During the past 7 years – from 2006 to 2013 – China’s corporate average fuel consumption reduction totaled 10.2%, about 2.3% on an annual average.
4. Most large manufacturers are faced with 4.3-5.8L/100km requirement in the Phase IV standards, with their current fuel consumption level about 144% of the 2020 target on average.
5. Imported manufacturers are facing a target of 5.93L/100km in 2020 and are currently meeting 155% of that target, requiring steep improvements in the future.
6. In order to meet the 2020 target of 5L/100km, which translates to an overall corporate average fuel consumption reduction of 30.7% in the coming 7 years (2014-2020), China must rely on the combined efforts of vehicle efficiency technologies, NEVs commercialization and incentivizing trading programs.
7. China is considering introducing fuel consumption credits and trade mechanisms during the Phase IV implementation stage.
THANK YOU!

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