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Clean Air Asia

CSE Workshop
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Overall Air Quality Improved

Concentration of 6 criteria air pollutants of 74 key cities from 2013 to 2017

- **PM$_{2.5}$ (-34.7%)**
- **PM$_{10}$ (-32.2%)**
- **SO$_2$ (-57.5%)**
- **CO (-32.0%)**
- **NO$_2$ (-9.1%)**
- **O$_3$ (20.2%)**

Annual mean concentration (unit: $\mu$g/m$^3$ CO: mg/m$^3$)  China NAAQS
Emissions from Vehicles Declines despite Surging Population

Changes of vehicle population and emissions (2012-2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>PM</th>
<th>Nox</th>
<th>HC</th>
<th>CO</th>
<th>Vechile Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>62.2</td>
<td>640</td>
<td>438.2</td>
<td>3471.7</td>
<td>224</td>
</tr>
<tr>
<td>2017</td>
<td>50.9</td>
<td>574.3</td>
<td>407.1</td>
<td>3327.3</td>
<td>310</td>
</tr>
<tr>
<td>Change(%)</td>
<td>-18.2%</td>
<td>-10.3%</td>
<td>-7.1%</td>
<td>-4.2%</td>
<td>+38.4%</td>
</tr>
</tbody>
</table>

Vehicle Population (million)
Nationwide Stringent Measures to Control Vehicle Emissions

Fuel Standard
- 2013: 150 ppm
- 2014: 350 ppm
- 2015: 50 ppm
- 2016: 10 ppm
- 2017: 10 ppm
- 2018: 10 ppm

Emission Standards
- 2013: China III
- 2014: China IV
- 2015: China V
- 2016: China 4
- 2017: China 5

Elimination of vehicles
- 2013: -1.02 million
- 2014: -6.11 million
- 2015: -1.26 million
- 2016: -4.05 million
- 2017: -3 million

Population of NEVs
- 2013: 0.12 million
- 2014: 0.58 million
- 2015: 1.09 million
- 2016: 1.53 million

Colors:
- Gasoline and LDGV: Blue
- Diesel and HDDV: Green
Tightens Compliance and Enforcement

Enterprise Information Disclosure of New Vehicles

<table>
<thead>
<tr>
<th>Year</th>
<th>Enterprise (#)</th>
<th>Vehicle model(#)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016 Q4</td>
<td>405</td>
<td>10702</td>
</tr>
<tr>
<td>2017</td>
<td>1031 (76%)</td>
<td>52952</td>
</tr>
</tbody>
</table>

Government Inspection of In-use Vehicles

![Graph showing inspection methods and percentage comparison between 2016 and 2017.](chart.png)

- Remote Sensing
- Roadside Inspections
- Percentage (%) of the total

- 2016: 8.4%
- 2017: 18.9%

Number (1 vehicle)

- 2016: 1408.8
- 2017: 3882.2
Mobile Source: Largest Contributor to PM2.5 in 4 Mega and Large Cities

Source apportionment results of PM2.5 in 4 cities (2014)

- **Beijing**: 31.1% Mobile Source, 22.4% Coal Combustion, 18.1% Industrial Production, 14.3% Fugitive Dust, 14.1% Other Sources
- **Shenzhen**: 41% Mobile Source, 28.0% Coal Combustion, 20.6% Industrial Production, 12% Fugitive Dust, 8% Other Sources
- **Hangzhou**: 28.0% Mobile Source, 22.9% Coal Combustion, 18.8% Industrial Production, 10.0% Fugitive Dust, 10% Other Sources
- **Guangzhou**: 21.7% Mobile Source, 35.8% Coal Combustion, 11.9% Industrial Production, 10.4% Fugitive Dust, 20.6% Other Sources
Shenzhen: Measures for Vehicle Emission Control

**Early Implementation of National Standards**
- China 4/IV ahead of national plan by 1 and 4 years respectively.
- China 5/V ahead of national plan by 2 years
- Plans to implement China 6 in 2019

**Phase-out of High-polluting Vehicles**
- Shenzhen eliminated all yellow-label vehicles by the end of 2015 and continues to eliminate outdated vehicles
- Subsidy provided for the elimination
- Traffic restrictions of these vehicles

**4 Key Measures**
- Promote DPF installation
- Bus, taxi and logistics vehicles
- Government subsidy

**DPF Installation on In-use Vehicles**

**Promotion of NEVs**
Shenzhen: No. 1 Promoting New Energy Vehicles

Continuous increase of NEV population driven by government subsidy

Bus
- 5,000+ fully electrified
- 48% (6560) of the total bus fleet.
- World's first all-electric bus city, world's No.1

Taxi
- 10,000+, world's No.1
- 65% (13,000+) of total amount; 100% electrification in 2018

Logistics vehicle
- # World's No.1 for 3 consecutive years since 2015
- 36,649 by the end of 2017

NEV population

- 6895
- 10919
- 40719
- 80828
- 155828
- 187100 (up to 2018.08)
Observations of Experiences

- Government plays the key role
- Set up specialized institute within the government
- Importance of data analysis and scientific study
- Phase approach of policy implementation
Observations of Lessons Learnt

- Technology readiness vs. cost consideration
- Public communications
- Manufacturers’ responsibility
THANKS

For more information: www.cleanairasia.org