

NGV (Natural Gas Vehicle) in Japan

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Contents

- What is Natural Gas Vehicle (NGV) ?
- What is CNG station ?
- Current status of NGV and CNG station in Japan
- What we have done and will do for creating NGV market in Japan

What is NGV ?

- NGV = A vehicle powered by natural gas
- Type of NGV
 - 1) Compressed Natural Gas (CNG) Vehicle
 - 2) Liquefied Natural Gas (LNG) Vehicle
 - 3) Adsorbed Natural Gas (ANG) Vehicle

Most of NGV \Rightarrow CNG vehicle

Approximately 10 million NGVs in the world

CNG vehicle

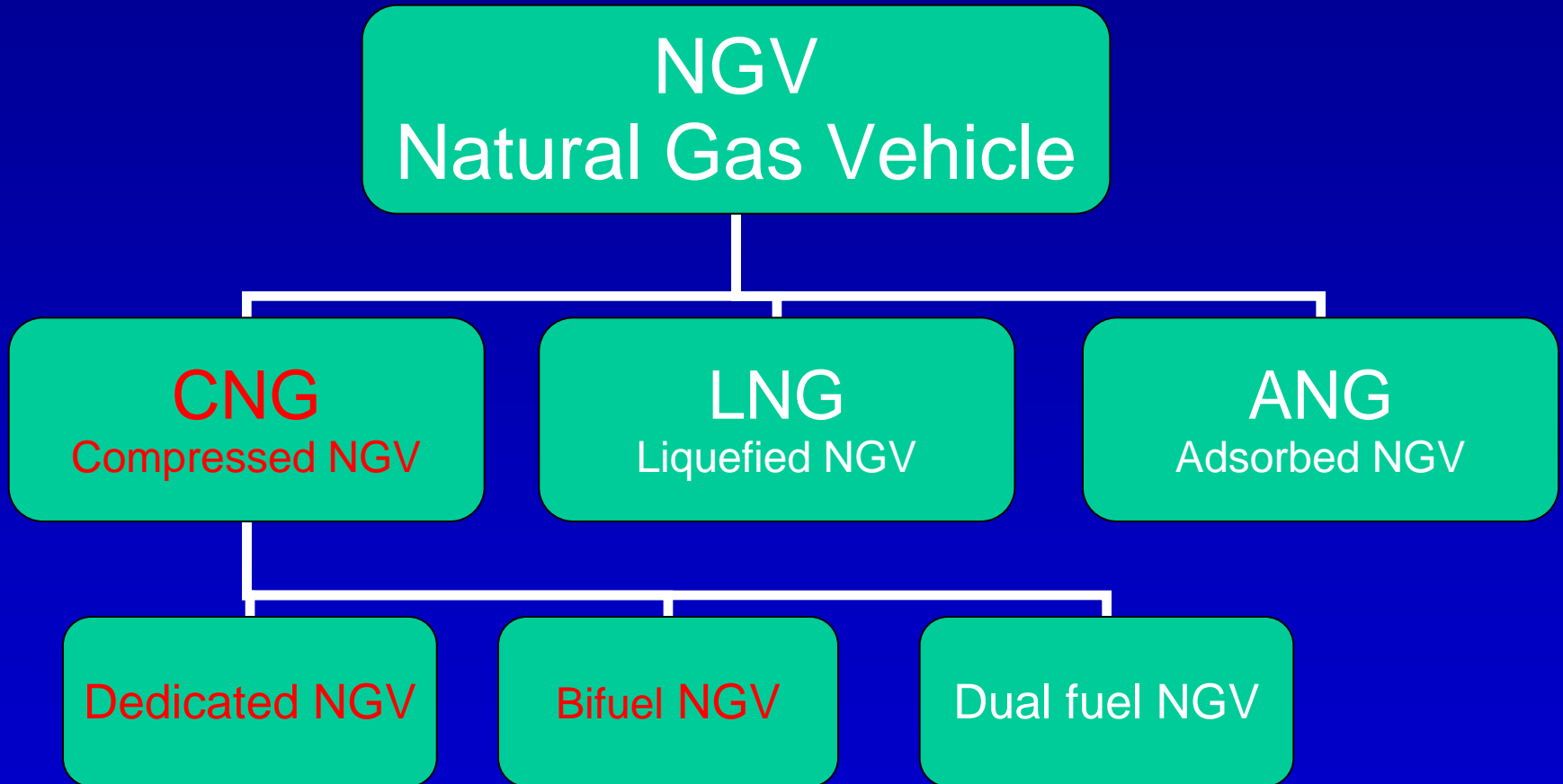
- Type of CNG vehicle

Dedicated NGV \Rightarrow Natural gas only

Bifuel NGV \Rightarrow Either natural gas
or gasoline

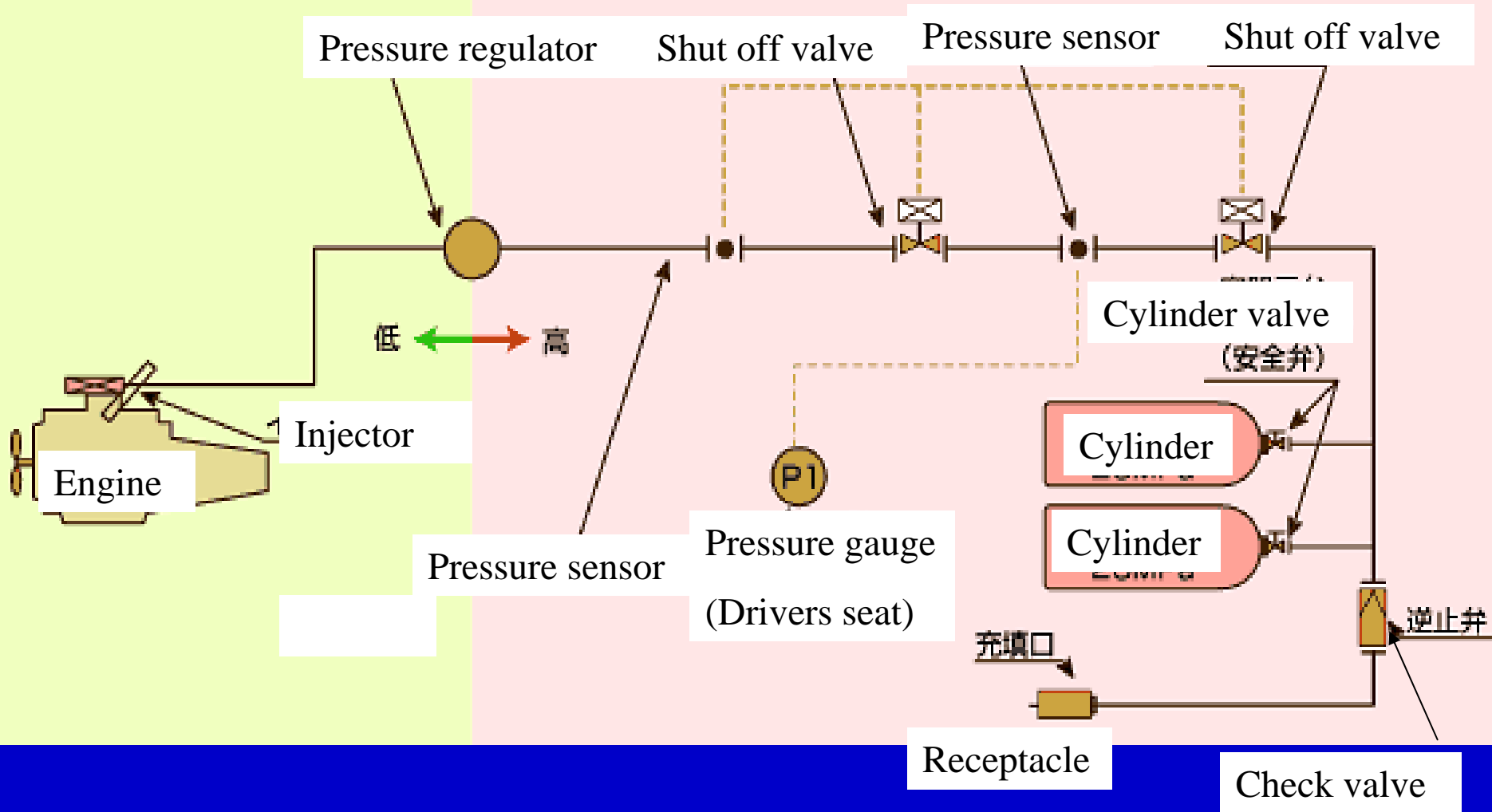
Dual Fuel NGV \Rightarrow Mixture of natural
gas and diesel

Type of NGV



Fuel Supply System

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NGV Characteristic

Advantage

- Low emission
- Noise reduction (Quietness)
- Wide variety of vehicles
passenger car, bus, truck, etc.



Clean tail pipe of NGV

Disadvantage

- Limited driving distance
- Heavy vehicle weight
- Expensive vehicle cost



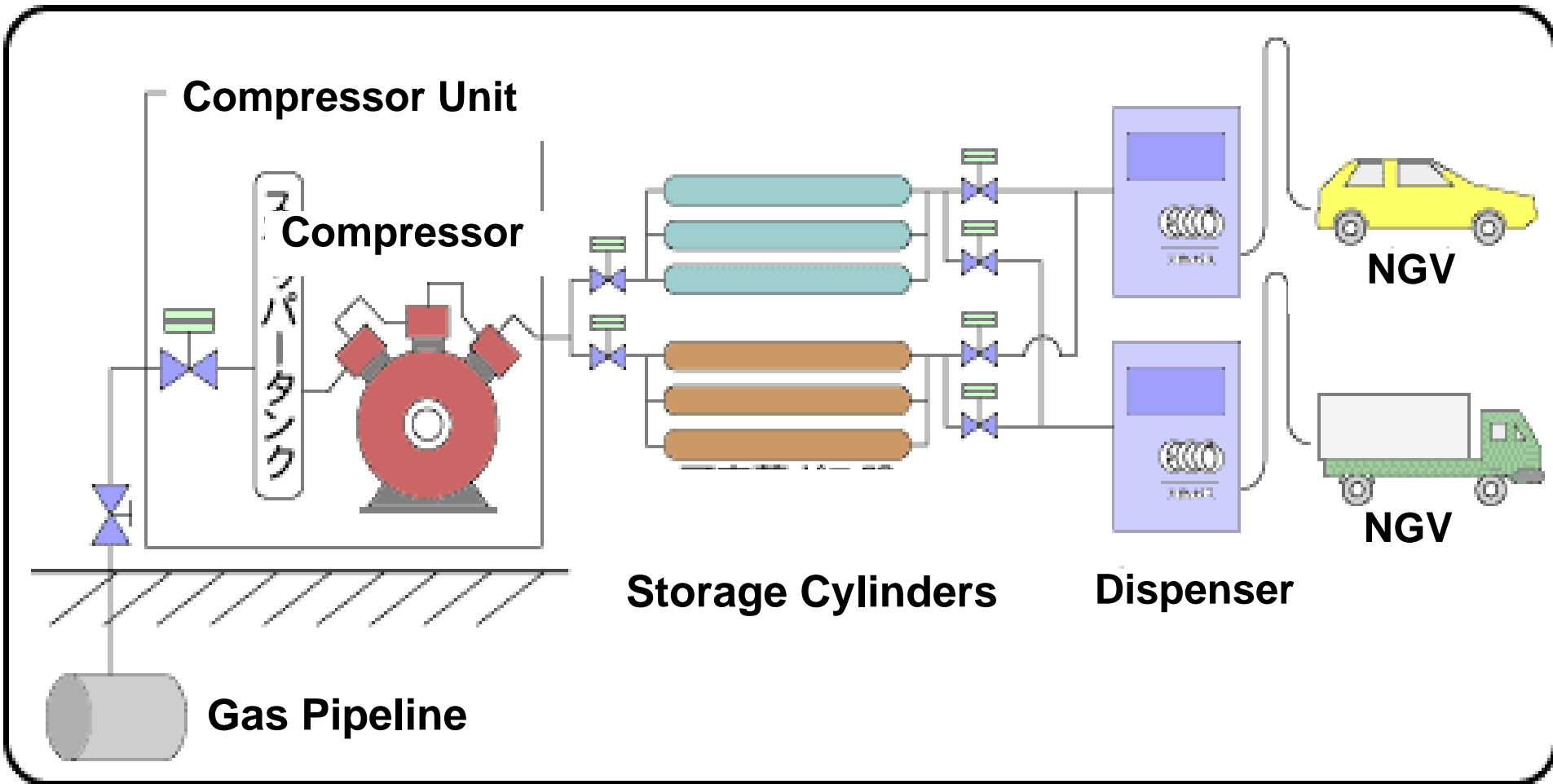
CNG cylinder for NGV

What is CNG station ?

- Quick refueling
- Similar to a gasoline station
- Connect medium pressure gas pipeline
- Compress natural gas by a compressor
- Around 5 minutes to refuel CNG through a dispenser

Outline of CNG Station

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0.1~1 MPa

25 MPa

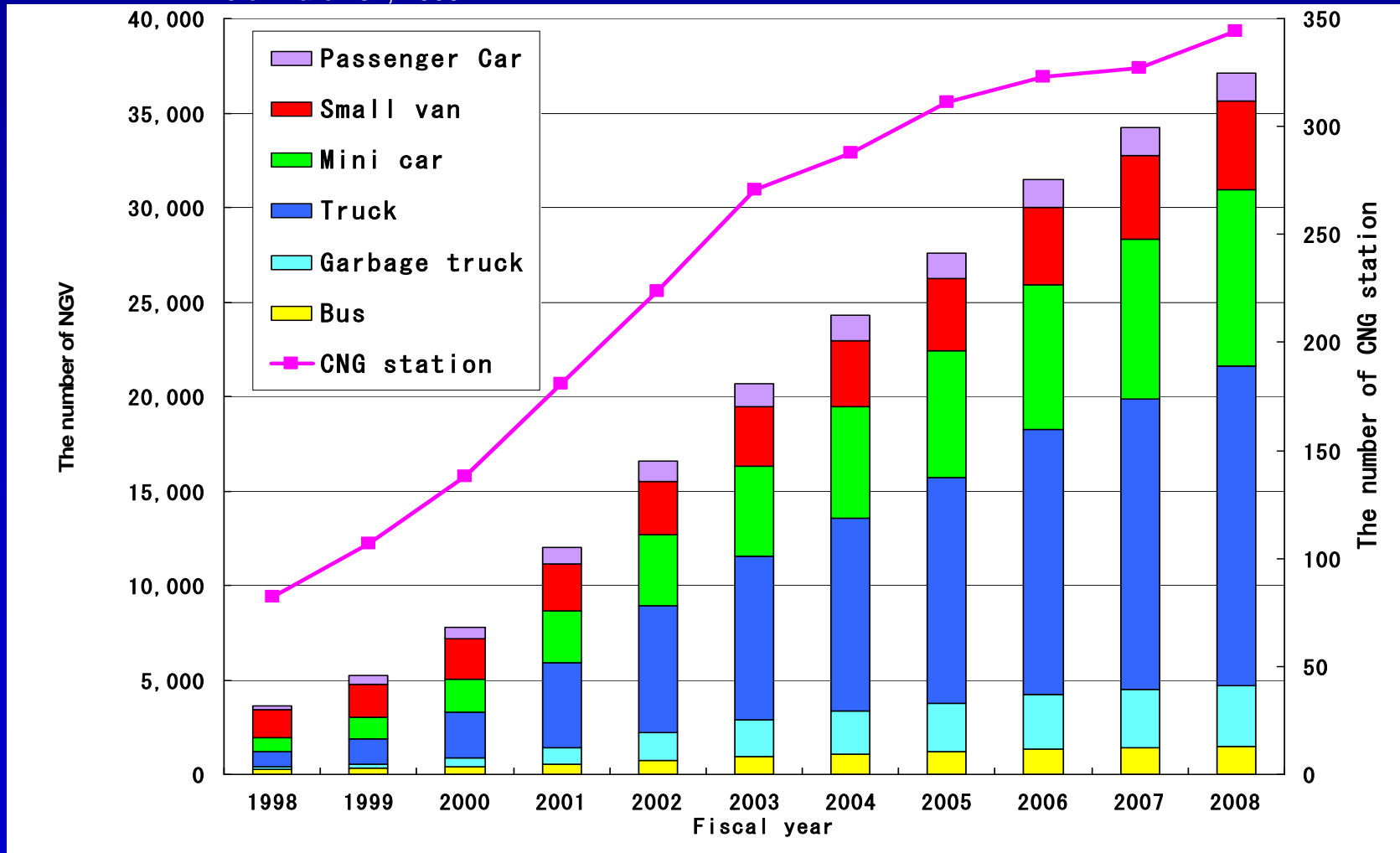
20 MPa

The Current Status of NGV and CNG Stations in Japan

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NGV 37,117 CNG station 344

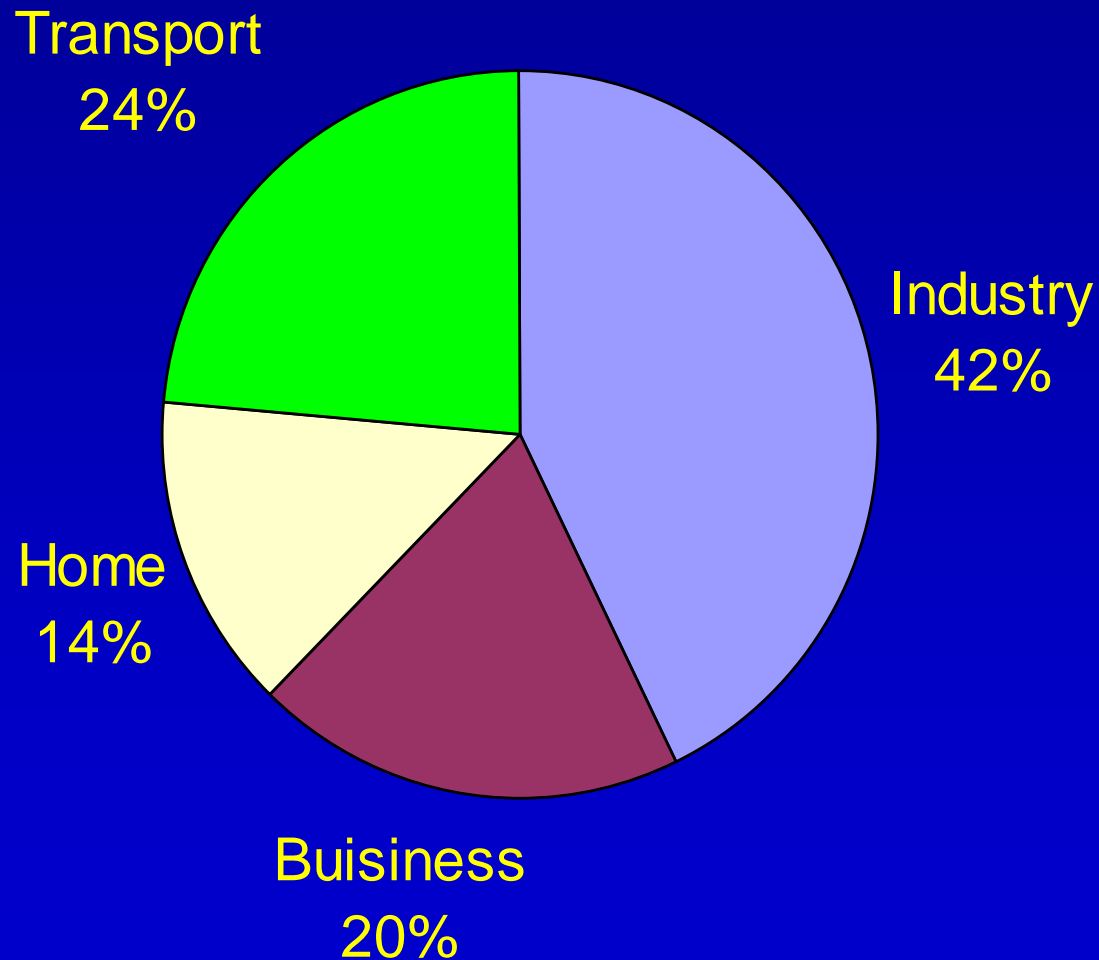
As of March 31, 2009



Why do we introduce NGV ?

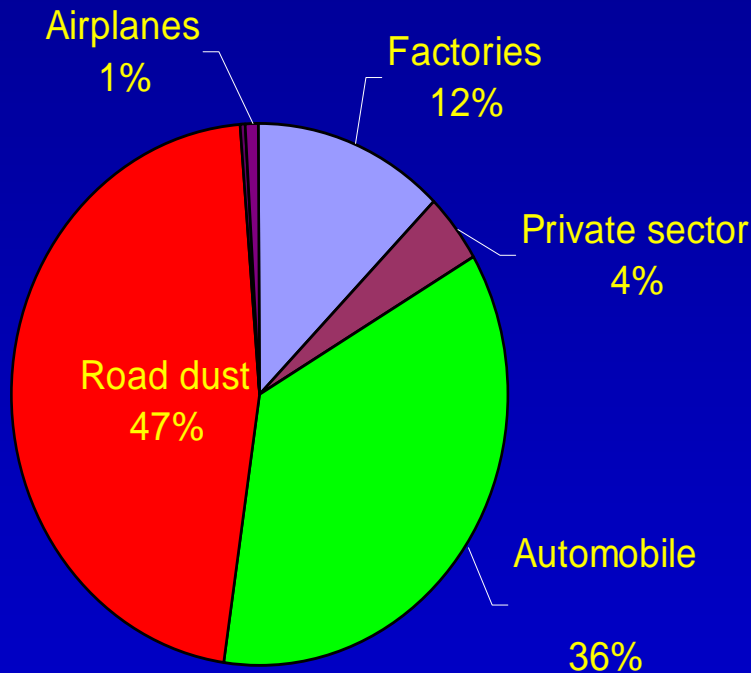
- **Background for the introduction of NGVs in Japan**
 - **Energy security for transportation sector**
 - **Natural Gas as an alternative energy**
 - **Environment**
 - **Cleaner burning fuel than Gasoline or Diesel**
 - **Nox, HC, CO, PM**
 - **Low CO₂ emission**

Final Energy Consumption

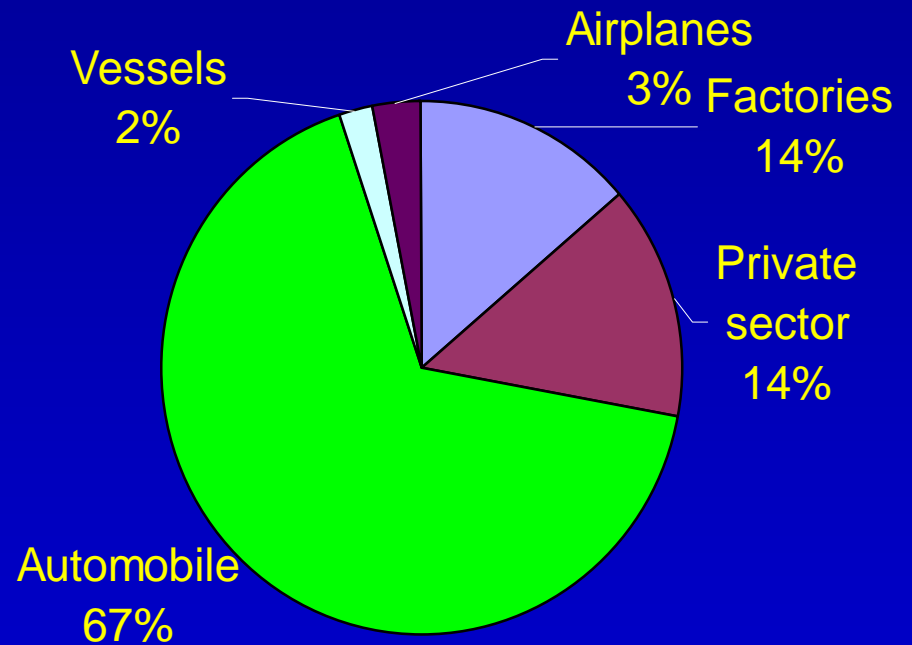


Sources of Air Pollution in Tokyo

SPM

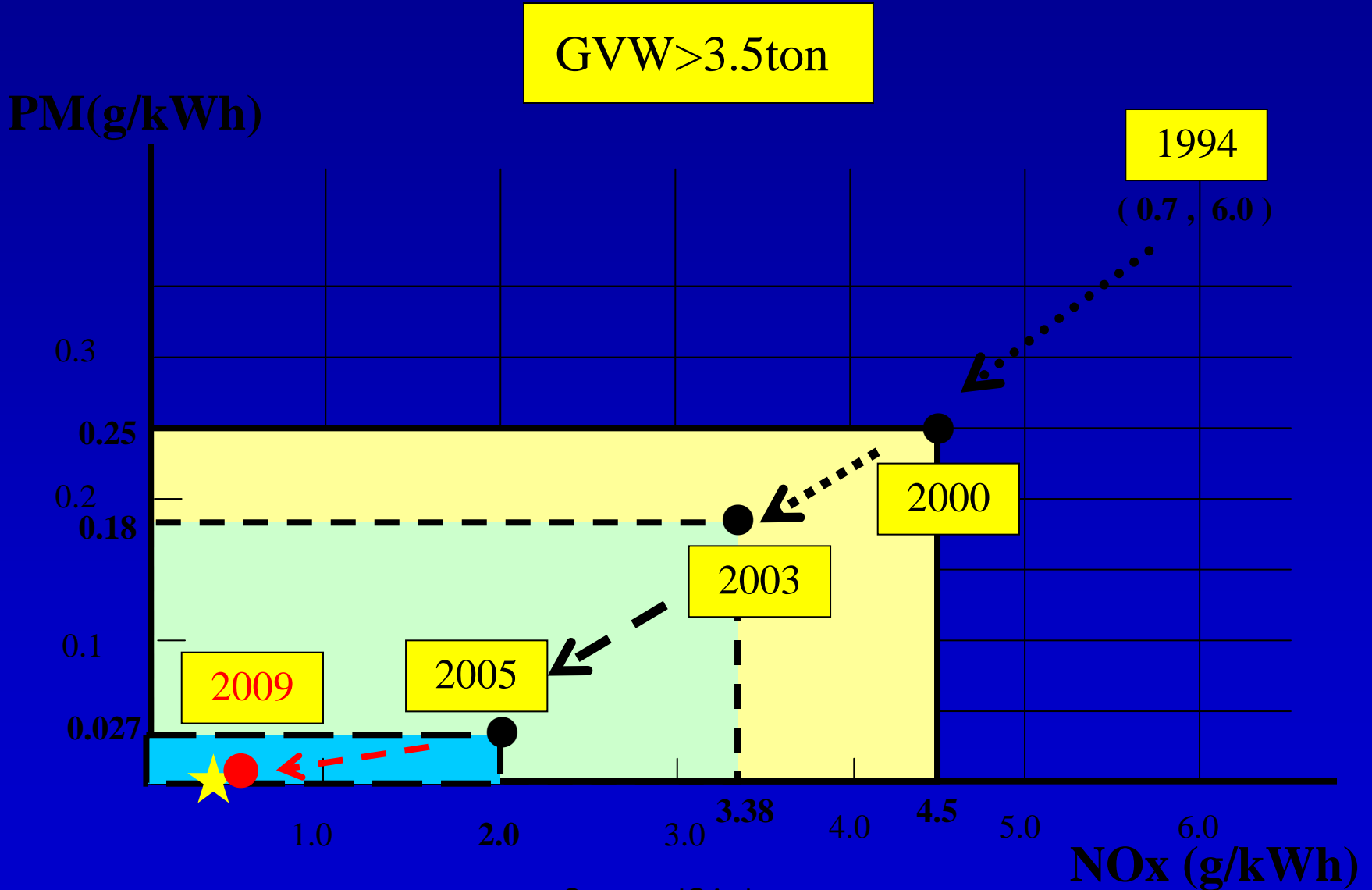


NOx



Diesel Emission Control

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Creating NGV Market Strategy

- No governmental support for the introduction of NGV
 - ➡ Tough lobbying and then get government support as subsidies and preferential taxation
- Various restrictions for NGV and CNG station
 - ➡ Deregulate and develop related law and standard
- Lack of OEM interest in NGV
 - ➡ Encourage automakers and let them develop OEM
- Small CNG station network
 - ➡ Provide CNG stations by gas industry

Around 40,000 NGVs in Japan

Our strategy for NGV is keep...

- negotiating with government for subsidies
- talking with car manufactures for OEM
- building CNG stations in particular areas
- encouraging fleet operators to use NGVs
- educating people



Symbol of NGV
that images blue sky and horizon

THANK YOU