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 ⇒ CNG vehicle

Approximately 10 million NGVs in the world
CNG vehicle

- Type of CNG vehicle
  - Dedicated NGV ⇒ Natural gas only
  - Bifuel NGV ⇒ Either natural gas or gasoline
  - Dual Fuel NGV ⇒ Mixture of natural gas and diesel
Type of NGV

NGV
Natural Gas Vehicle

CNG
Compressed NGV

LNG
Liquefied NGV

ANG
Adsorbed NGV

Dedicated NGV
Bifuel NGV
Dual fuel NGV
NGV Characteristic

Advantage

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

Disadvantage

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

Compressor Unit

Storage Cylinders

Dispenser

NGV

Gas Pipeline

0.1 ~ 1 MPa

25 MPa

20 MPa
The Current Status of NGV and CNG Stations in Japan

NGV 37,117  CNG station 344

As of March 31, 2009

IEEJ: April 2010
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

- Industry: 42%
- Business: 20%
- Home: 14%
- Transport: 24%
Sources of Air Pollution in Tokyo

SPM
- Road dust: 47%
- Automobile: 36%
- Factories: 12%
- Private sector: 4%
- Airplanes: 1%

NOx
- Road dust: 47%
- Automobile: 67%
- Factories: 12%
- Private sector: 14%
- Airplanes: 3%
- Vessels: 2%

IEEJ: April 2010
Diesel Emission Control

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<tr>
<td>2009</td>
<td>0.25</td>
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Source: JGA data
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