Government Initiative for Promoting Next Generation Vehicles

Purpose: Information
Submitted by: Japan
Government Initiative for Promoting
Next Generation Vehicles

April, 2014
Ministry of Economy, Trade and Industry
Next-Generation Vehicle Plan 2010 (Outline)

**- Rapid growth of emerging markets and trends toward green vehicles in developed markets**

<table>
<thead>
<tr>
<th>Year</th>
<th>North America</th>
<th>Japan</th>
<th>Europe</th>
<th>(万台)</th>
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<tbody>
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<td>1930</td>
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<td>2008</td>
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![Graph showing vehicle sales](chart.png)

**Overall plan**
- next-gen. vehicle development and production

**Batteries**
- Secure battery R&D and technology
- Improve performance of lithium-ion batteries
- Develop post-lithium-ion batteries
- Achieve economies of mass production by promoting EVs
- Create an environment for secondary use of batteries

**Rare metals**
- Secure rare metals and build resource recycling systems

**Infrastructure**
- Install 2 mil. normal chargers & 5,000 quick chargers

**Systems**
- Vehicles with systems (smart grid, etc.)
- Create new business models in EV/PHV towns.
- Verify systems through the Next-Generation Energy and Social System Demonstration program.
- Promote international standardization and business development based on the verification results

**International standards**
- Strategic international standardization

**External factors affecting the auto industry**
- Great changes in the competition environment
  - Alliance based on environmental technology
- Energy constraints
  - High oil prices in the medium-to-long term
- Global warming prevention
  - Target of reducing GHG by 25% from the 1990 level by 2020
- New industry
  - Making EVs and batteries the growth driver

**Six Plans**

1. **Emerging markets**
   - Increase in the vehicle-buying population, along with economic development
   - Mature, stable markets
   - Diversifying users and social needs
2. **Developed markets**
   - Mature, stable markets
   - Diversifying users and social needs

**Infrastructure Development**
- Mainly in EV/PHV towns
- Install 2 mil. normal chargers
- 5,000 quick chargers
- 508万台 quick chargers

**Battery R&D**
- Batteries
- Lithium-ion batteries
- Technology (set in 2006)

**Resource Strategy Roadmap**
- Install infrastructure
- Compile EV/PHV town best practice handbook
- Collaborate with the private sector (CHAdeMO Association)

**International Standardization Roadmap**
- Establish international standards for battery performance and safety evaluation methods.
- Establish international standards for charging connectors/systems.
- Enhance public/private organization for standardization.
- Develop human resources for standardization.
Government targets by type of NGV

Ratio of the NGV sales to the total new passenger vehicle sales

<table>
<thead>
<tr>
<th>Type of NGV</th>
<th>2020</th>
<th>2030</th>
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<tbody>
<tr>
<td>Conventional vehicles</td>
<td>50~80%</td>
<td>30~50%</td>
</tr>
<tr>
<td>Next-generation vehicles</td>
<td>20~50%</td>
<td>50~70%</td>
</tr>
<tr>
<td>Hybrid vehicles</td>
<td>20~30%</td>
<td>30~40%</td>
</tr>
<tr>
<td>Electric vehicles</td>
<td>15~20%</td>
<td>20~30%</td>
</tr>
<tr>
<td>Plug-in hybrid vehicles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel cell vehicles</td>
<td>~1%</td>
<td>~3%</td>
</tr>
<tr>
<td>Clean diesel vehicles</td>
<td>~5%</td>
<td>5~10%</td>
</tr>
</tbody>
</table>

Sales volume of passenger vehicles = 4,570,000 units (2012)
Notification of subsidies for measures to promote the introduction of clean energy vehicles

Do You Know about the Subsidies for CEV (Clean Energy Vehicles)?

Examples of applicable vehicles and amount of subsidies

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Environmental performance of both electric and hybrid vehicles</th>
<th>Significant reduction of soot (PM), NOx, and CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric vehicle</td>
<td>Maximum subsidy ¥740,000 =USD 7,400</td>
<td>Maximum subsidy ¥200,000</td>
</tr>
<tr>
<td></td>
<td>No CO₂ emissions and quiet during driving</td>
<td></td>
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<tr>
<td>Plug-in hybrid vehicle</td>
<td>Maximum subsidy ¥780,000 =USD 7,800</td>
<td>Maximum subsidy ¥180,000</td>
</tr>
<tr>
<td>Clean diesel vehicle</td>
<td>Maximum subsidy ¥450,000 =USD 4,500</td>
<td></td>
</tr>
</tbody>
</table>

Maximum subsidy amounts are subject to maximum limits.

Available for: individuals, corporations, and local governments purchasing EV, PHV, or CDV (except vehicles with a black or green license plate).

Application period:

For charging facilities, half of the cost is subsidized (subject to a maximum limit).

Next-Generation Vehicle Promotion Center

http://www.cev-pc.or.jp
Targets of EV Charger installation: How we deploy the charging infrastructure?

Targets for 2020

Normal Chargers (NC): 2 Million
Quick Chargers (QC): 5,000

- EVs should basically be charged by NC at night.
- A certain number of QC should also be installed as a “safety net”.

How do we start?

At the Market Preparation Stage, we build infrastructure intensively and systematically mainly in EV/PHV towns

- Establish infrastructure development guidelines
- Compile EV/PHV town best practice handbook (including business models)

→ Pave the way for the Diffusion Stage
Outline of the EV&PHV Town Concept

Outline

○ The "EV&PHV Town Concept" is a model project for a demonstration experiment toward full-fledged dissimulation of EV/PHV, which is formulated in the "Action Plan for Achieving a Low-Carbon Society".

○ Creating initial demand for EV/PHV requires the intensive development of charging infrastructure and public awareness activities. Thus, under the concept, local government that are taking the lead in the penetration of EV/PHV were selected as model regions ("EV&PHV Town").

○ In each EV&PHV Town, intensive development of environmental infrastructure will be pursued for the introduction of EV/PHV in cooperation with local enterprises. From this, penetration models that take regional characteristics into account will be established and then applied to all areas of Japan.

Arrival point at 2011

○ Within the EV / PHV town planning, each EV and PHV town will carry out plan specification, plan execution, and result-sharing information to achieve each aim and objective.

○ Officially issue *Best Practices Handbook Volumes 1 and 2* as a deliverable of the EV / PHV configuration
In increasingly isolated regions, the number of gas stations is declining, which forces residents to drive long distances for gas. Here, EV/PHV, which can be charged at home, could be a suitable alternative.

Efforts are also underway to electrify light trucks that are in high demand in rural regions.

1) The semi-mountainous areas of Takayama City, Gero City, and Nakatsugawa City were selected as demonstration regions.

Three elements that characterize semi-mountainous regions were defined: “cold region,” “large elevation differences,” and “few gas stations.”

2) Three participants were recruited and selected from each region (total of 9 participants) using the Internet and other means. The participants were lent EV/PHV for one month periods during the spring, summer, autumn, and winter.

3) From results obtained from the spring demonstration, no obvious disadvantages attributable to semi-mountainous characteristics were seen, while the vehicles’ advantage as a means of overcoming the problem of increasingly sparse gas stations by reducing fuel costs was clearly evident. In the future, further testing will determine the effect of air conditioner/heating use during the winter.

The average total distance driven by all participants during the demonstration was large at 1,140 km per month. At the same time, the average amount that fuel costs were reduced was 9,000 yen per month (indicating the vehicles’ large effect in reducing fuel costs).
EV tourism: Aomori Oirase Gorge Park & EV Ride

Oirase Gorge in Aomori Prefecture is the only area of Japan’s 29 national parks where a national highway passes through the middle (along the gorge) of a specially protected area. This makes expanding restrictions on the passage of private vehicles in the gorge essential to ensuring its appropriate use. However, a delay in the construction of a bypass route presents a problem here.

Consequently, Aomori Prefecture is studying a system (“park & EV ride”) that will encourage people to change to electric vehicles when restrictions on private vehicles are in place.

Expanded frequency of restriction application (conceptual image)

- 2 days, once a year
- For 1 or 2 weeks
- For 1 month

Expanded scope of restrictions on private vehicles (vehicles allowed to pass)

1) Shuttle buses, route buses (allowed to pass as a substitute means of transportation)
2) EV (rental cars) (Applied on weekdays; creation of added value through use of EV)
3) Large vehicles (allowed to pass due to lack of alternative route until completion of the bypass)
4) Permitted vehicles (Vehicles that would be significantly inconvenienced by detours required by the expanded restriction period [e.g., vehicles used by local residents to commute to school or work] are allowed to pass.)

Proposed model for a “park & EV ride” system

Rental car businesses
Secure higher EV operating rate

Local organizations, enterprises, etc.
Use of EV as official/company vehicles on weekdays

Tourists
Use of EV by tourists on weekends and holidays (change from private vehicles)

Use on weekdays
Use on weekends and holidays

Questionnaire survey of participants in a test-drive event held during restrictions on private vehicles

Question: Would exemption of EV from private vehicle restrictions motivate you to purchase an EV?

Yes, 25%, 52%
No, 23%, 48%
1. Budget and project period

Budget: ¥100.5 billion (FY2012 supplementary budget)
Application period: March 19, 2013 to February 27, 2015

2. Costs subsidized and the grant rate

Subsidies are granted to those newly purchasing and/or installing a charger under the following four classifications:

<table>
<thead>
<tr>
<th>Project class</th>
<th>Outline</th>
<th>Costs subsidized</th>
<th>Grant rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Installation of charging facilities with high public value* under the vision for charger installation specified by local governments, etc.</td>
<td>Charger purchase and installation costs</td>
<td>2/3</td>
</tr>
<tr>
<td>#2</td>
<td>Installation of charging facilities with high public value* even though not under the above vision</td>
<td>Charger purchase and installation costs</td>
<td>1/2</td>
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<tr>
<td>#3</td>
<td>Installation of charging facilities in the parking lot of a residential complex, monthly parking lot, etc.</td>
<td>Charger purchase and installation costs</td>
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<tr>
<td>#4</td>
<td>Installation of charging facilities other than the above</td>
<td>Charger purchase costs</td>
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* “High public value” must meet the following requirements.

1. The charging facilities must be freely accessible by anyone from the entrance facing a public street.
2. Use of the charger must not require the use of other services (such as food and drink).
3. Users must not be restricted. (However, charging facilities that can be used by paying a fee are acceptable.)
Japanese automobile manufactures and 13 energy business operators announced a joint statement about fuel cell vehicles (FCVs) on January of 2011. The substances are that ①to bring FCVs to market in 2015, and ②to develop hydrogen refueling stations centering four main urban areas.

Japan Revitalization Strategy (decided by Cabinet Meeting of June 14, 2013) targeted to the fastest diffusion of FCV in the world, by installing about 100 hydrogen stations with focusing around four main urban areas toward the product releases of FCV in 2015.

Participant enterprises to the joint statement

- Automobile manufacturers: Toyota, Nissan, Honda
- Petroleum companies: JX Nippon Oil & Energy Corp., Idemitsu, Showa Shell, COSMO OIL
- Town gas companies: Tokyo Gas, Osaka Gas, Toho Gas and Saibu Gas
- Industrial gas companies: Iwatani Corporation, Taiyo Nippon Sanso

Collaboration of Auto manufacturers

<table>
<thead>
<tr>
<th>Toyota, BMW</th>
<th>Nissan, Daimler, Ford</th>
<th>Honda, GM</th>
<th>Hyundai</th>
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</table>
| <Announced on Jan. 24, 2013>  
  • An agreement was reached regarding joint development of FCVs.  
  • Sales of FCVs will start in 2015. | <Announced on Jan. 28, 2013>  
  • An agreement was reached regarding joint development of FCVs.  
  • Production model FCVs are scheduled for delivery in 2017. | <Announced on Jul. 2, 2013>  
  • An agreement was reached regarding joint development of FCVs.  
  • Sales of FCVs will begin in 2015. | <Announced on Feb. 26, 2013>  
  • Plans have been made for the mass-production of 1,000 FCVs by 2015. |

Sources: Diverted from the press releases
Fuel Cell Vehicles ③: Activities for Developing Hydrogen Refueling Stations

- For the market introduction of fuel cell vehicles in 2015, it is necessary to develop hydrogen refueling stations, which are essential infrastructure, on a timely basis, in addition to improving the performance, safety, etc. of the fuel cell vehicles themselves and achieving low costs.
- For these standpoints, the following actions have been taken to lower the cost of hydrogen station installation in Japan which is acknowledged as relatively expensive than other countries(*In Europe and the US: 100～200 million yen, In Japan: 500～600 million yen).

Activities aimed at promotion of development of hydrogen refueling stations

① Subsidization of development
- Prior to putting fuel cell vehicles on the market, part of the hydrogen station development costs will be subsidized.

② Reexamination of restrictions
- As for restrictions in the High Pressure Gas Safety Law, reexamination will be made of matters such as the design criteria for pressure vessels and restrictions on usable steel stock.
- Based on the Restriction Reform Implementation Plan (decided by Cabinet Meeting in June 2013), reexamination of restrictions will be accelerated for 24 items.

③ Achievement of low costs of component devices
- With regard to equipment consulting hydrogen production devices, compressors, pressure accumulators, etc., technical development will be carried out to reduce costs.

④ Creation of initial demand
- The number of fuel cell vehicles is use small in the Initial stage.
- Therefore, it is necessary to create initial demand, for example, for vehicles for business use, such as administrative vehicles, buses, and taxis. In cooperation with local autonomous bodies and private enterprises.

【Sources】: Diverted from materials of the 8th Strategic Policy Committee, Advisory Committee for Natural Resources and Energy