R&D & Manufacturing in Kanagawa Prefecture
- Example of Nissan Motor Co., Ltd. -

November 4th, 2009

Tadao Takahashi
President, Kanagawa-Ken Employer's Association
Ex. EVP and Vice Chairman, Nissan Motor Co., Ltd.
Nissan and Detroit 2 in Kanagawa in 1930’s

- **Ford Japan Koyasu factory (1929-1939)**
- **Ford Japan Midorimachi factory (1925-1928)**
- **Kyoritu automobile factory (Chrysler) (1930-1939)**
- **Nissan Yokohama Plant (1935-)**
- **Site for a Ford Japan’s new factory**

Nissan was established in Yokohama in 1933
NISSAN & Kanagawa Employers Associations

Nissan’s EV strategy and Kanagawa

Why Nissan concentrated its global function in Kanagawa?
NISSAN & Employers Associations Kanagawa
Nissan’s presence in Kanagawa Pref.

<table>
<thead>
<tr>
<th>Global HQs</th>
<th>Nissan Motor Co., Ltd</th>
<th>3,400</th>
<th>Aug. 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D</td>
<td>Research center (Oppama)</td>
<td></td>
<td>Apr. 1961</td>
</tr>
<tr>
<td></td>
<td>Advanced Technology Center</td>
<td>1,600</td>
<td>Jan. 2004</td>
</tr>
<tr>
<td></td>
<td>Technical Center</td>
<td>17,700</td>
<td>Nov. 1981</td>
</tr>
<tr>
<td></td>
<td>Powertrain Engineering Div.</td>
<td></td>
<td>July 1948</td>
</tr>
<tr>
<td></td>
<td>Oppama Proving Ground</td>
<td></td>
<td>June 1961</td>
</tr>
<tr>
<td>Production</td>
<td>Oppama Plant</td>
<td>2,600</td>
<td>Oct. 1961</td>
</tr>
<tr>
<td></td>
<td>Oppama Wharf</td>
<td></td>
<td>May 1983</td>
</tr>
<tr>
<td></td>
<td>Yokohama Plant</td>
<td>3,400</td>
<td>Apr. 1935</td>
</tr>
<tr>
<td></td>
<td>Zama Operation Center</td>
<td>2400</td>
<td>Dec. 1964</td>
</tr>
<tr>
<td></td>
<td>Honmoku Wharf</td>
<td>360</td>
<td>June 1967</td>
</tr>
<tr>
<td></td>
<td>Sagamihara Parts Center</td>
<td>370</td>
<td>Apr. 1972</td>
</tr>
<tr>
<td>Affiliates</td>
<td>Nissan Shatai Co., Ltd.</td>
<td>4,200</td>
<td>Apr. 1949</td>
</tr>
<tr>
<td>Supplier</td>
<td>Kalsonic kansei, Unipres Corp., Kasai Kogyo Co., Ltd.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hitachi Automotive Systems, etc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Nissan facilities & plants in Kanagawa

Nissan is concentrating allocation of facilities in Kanagawa

May 2007
Global Production Engineering Center
(in Zama Operation Center)

Jan. 2006
Global Training Center

Nov. 2006
Global Training Center

Aug. 2009
Global HQs

April 2005
Nissan Learning Center
Management Institute

Yokohama Plant

Oppama Plant

Research Center

Technical Center

May 2007
Advanced Technology Center
Kanagawa-Ken Employers’ Association

- Established January 18, 1949
- Membership: 450 companies

<Breakdown>
- Large companies: 30%
- Small & Medium companies: 70%
- Manufacturing: 60%
- Non-Manufacturing: 40%

- Description of business
  1. Deepen exchanges and mutual edification among member companies and their leaders.
  2. Investigation on improving company's management and development of the industry.
  3. Establishing partnership with government institution and related associations.
Global companies which invested to Kanagawa Pref. by using “Invest Kanagawa” scheme.

<table>
<thead>
<tr>
<th>Company</th>
<th>R&amp;D</th>
<th>Plant</th>
<th>HQs</th>
<th>Investment amount (Oku-Yen)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUJIFILM</td>
<td>○</td>
<td></td>
<td></td>
<td>460</td>
<td>Advanced technology center</td>
</tr>
<tr>
<td>AJINOMOTO</td>
<td>○</td>
<td>○</td>
<td></td>
<td>400</td>
<td>Leading technology research center</td>
</tr>
<tr>
<td>NISSAN</td>
<td>○</td>
<td></td>
<td>○</td>
<td>984</td>
<td>GHQ, NATC</td>
</tr>
<tr>
<td>SONY</td>
<td>○</td>
<td></td>
<td></td>
<td>290</td>
<td>Technology center expansion</td>
</tr>
<tr>
<td>CANON</td>
<td>○</td>
<td></td>
<td></td>
<td>213</td>
<td>Next generation display R&amp;D center</td>
</tr>
<tr>
<td>FUJI XEROX</td>
<td>○</td>
<td></td>
<td></td>
<td>450</td>
<td>Integration of R&amp;D center in Yokohama</td>
</tr>
<tr>
<td>JFE STEEL</td>
<td></td>
<td>○</td>
<td></td>
<td>100</td>
<td>New shaft furnace</td>
</tr>
<tr>
<td>MITSUBISHI HEAVY INDUSTRIES</td>
<td></td>
<td>○</td>
<td></td>
<td>140</td>
<td>Mother factory for turbo charger</td>
</tr>
</tbody>
</table>
Nissan’s EV strategy and Kanagawa
Zero-Emission vehicle is the ultimate goal for CO2 reduction

New car's CO2 emissions (Well To Wheel) (%)

- Gasoline cars
- Diesel cars
- HEVs
- FCVs
- EVs

Zero-emission vehicle
Nissan’s Triple Layered Approach

- Comprehensive approaches through *Vehicle, Driver, and Society* to achieve sustainable mobility society effectively.

- **Reduce congestion**
- **New transportation, and mobility net-working**

- **Support ECO-drive**
  - Eco meter
  - Eco-advice
  - Eco-pedal

- **Engine/Transmission**
- **HEV, EV, FCV**
- **Bio Fuel Vehicle**

Fastest route
## Nissan’s new EV “LEAF”

<table>
<thead>
<tr>
<th>Size</th>
<th>Compact car class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seating</td>
<td>5</td>
</tr>
<tr>
<td>Battery</td>
<td>Laminated compact Li-ion battery</td>
</tr>
<tr>
<td>Motor</td>
<td>High-response AC synchronous motor</td>
</tr>
<tr>
<td>Cruising Range</td>
<td>160km (US-LA4 mode)</td>
</tr>
<tr>
<td>Major features</td>
<td>Dedicated IT system</td>
</tr>
<tr>
<td></td>
<td>Ample cabin space</td>
</tr>
<tr>
<td></td>
<td>Stimulating acceleration</td>
</tr>
<tr>
<td></td>
<td>Sufficient cruising range for daily use</td>
</tr>
<tr>
<td></td>
<td>Charging support for secure feel</td>
</tr>
</tbody>
</table>
Becoming a leader with zero-emission vehicles

Nissan’s advanced lithium ion battery technology

**Double output**
- Conventional type
- Laminated type

> 2.5 kW/kg*  

**Double energy**
- Conventional type
- Laminated type

140 Wh/kg*  

**Half the size**
- Cylindrical type
- Laminated type

High reliability has been secured

Lithium manganese spinel with stable crystal structure even under overcharged conditions

A laminated structure having outstanding cooling performance

Securing of stability through cell management
Automotive Energy Supply Corporation

- AESC: a joint-venture of Nissan (51%) and NEC group (49%).
- AESC enables to:
  - develop optimized battery for electric powered vehicle from material selection to vehicle application.
  - provide assurance based on the deep understanding and experience of vehicle installations.
Nissan will partner with select public and private organizations to contribute to zero emission society with EVs globally.
New businesses surrounding EV

- To expand EV, consider wide range of views on energy supply, power storage and optimization of mobility

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**Introduction of clean energy**

- **Power production**
- **Power network**
- **Charge network**

**Power supply stabilization**

**Peak shaving**

**Storage of energy**

---

**EV • Battery**

**BAT company**

**Optimization of mobility**

- Car sharing
- Park & ride
- ITS support

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**EV**

**Battery reuse**
**Yokohama Mobility “Project ZERO”**

Low carbon model city concept

- **Nissan**
  - Provide technology and measures
  - Send information

- **Yokohama city**
  - Implement measures
  - Encourage citizen’s & companies’ participation
  - Send information

- **University of Tokyo**
  - Develop traffic simulations
  - Assess effects

YMPZ
Nissan’s EV is made in Kanagawa

Nissan allocated all EV related facilities from R&D to production in Kanagawa Prefecture. Batteries, Motors and inverters will be also produced in Kanagawa.
Why Nissan concentrated its global function in Kanagawa?
Advantage of Kanagawa

- Support from local government
- Infrastructure: roads, port and airport
- Gathering of manufacturing industry
- Human resource: many scholastic institutions
- Location: short range from Tokyo
Thank you for your attention!