Business Strategy of Automotive Systems Group
Business Strategy of Automotive Systems Group

Contents

Ⅰ Market Environment and Hitachi’s Approach

Ⅱ Growth Strategies for the Future

Ⅲ Summary
1. Automobile Manufacturing Trends

Worldwide Automobile Production

(Million vehicles/year)


Market trend is of expansion in the Asia and Other region, particularly in China

Source: Statistics from OICA and others, Hitachi estimates
Value of Worldwide Auto Market

Automobiles
- 135 trillion yen

Automotive parts
- 78 trillion yen

Automotive Systems Group business sphere worth around 44 trillion yen
- Engine-related components
- Electrical equipment and electronic parts
- Drive trains, transmissions and steering gears
- Information devices, other

Source: Automotive Yearbook 2006-2007 and others, Hitachi estimates
### Market Environment and Hitachi’s Approach


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<th>Trends and regulations</th>
<th>Market needs</th>
<th>Hitachi systems</th>
<th>Technology to meet needs</th>
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<td>Fuel-efficient vehicles</td>
<td>Direct Gasoline Injection System</td>
<td>Airflow sensors</td>
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<td>CO₂ regulations</td>
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<td>Variable Valve Actuation System</td>
<td>VEL, VTC</td>
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<td>Hybrid System</td>
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<td>Reduction of</td>
<td>Active safety</td>
<td>All-azimuth surrounding recognition systems</td>
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<td>road traffic accidents</td>
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<td>Vehicle motion management system</td>
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<td>Information</td>
<td>Reduction of</td>
<td></td>
<td>Cooperative control navigation system</td>
<td>Cameras</td>
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<td>driving stress</td>
<td>Next-generation</td>
<td>Multi-functional audio-visual navigation system</td>
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<td>Telecommunications</td>
<td>telematics services</td>
<td>VRM system</td>
<td>Brakes</td>
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<td></td>
<td>infrastructure</td>
<td></td>
<td></td>
<td>Suspension</td>
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</tbody>
</table>

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VEL: Continuous Variable Valve Event and Lift Control System  
VTC: Valve Timing Control System  
VRM: Vehicle Relationship Management  
ITS: Intelligent Transport Systems
Market Environment and Hitachi’s Approach

4. Strengthening Structural Base in Each Segment

<table>
<thead>
<tr>
<th>Year</th>
<th>Environment</th>
<th>Safety</th>
<th>Information</th>
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</thead>
<tbody>
<tr>
<td>’01</td>
<td>Established new company in Suzhou, China</td>
<td>UNISIA JECS becomes wholly owned subsidiary</td>
<td>Established joint venture company, HCX</td>
</tr>
<tr>
<td>’02</td>
<td>Established new company in Germany</td>
<td>Merger with Hitachi Unisia Automotive and TOKICO</td>
<td>Xanavi Informatics becomes wholly owned subsidiary</td>
</tr>
<tr>
<td>’03</td>
<td>Established new company in Shanghai, China</td>
<td></td>
<td></td>
</tr>
<tr>
<td>’04</td>
<td>Established Motor Power Systems Division</td>
<td></td>
<td>Clarion becomes subsidiary</td>
</tr>
<tr>
<td>’05</td>
<td>Hitachi Mobile becomes wholly owned subsidiary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>’06−</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CIS: Car Information Systems
5. Strategic Goals until fiscal 2010

Fiscal 2010 sales of 1 trillion yen
Operating profit margin of at least 7%

Revenues

(billion yen/year)

<table>
<thead>
<tr>
<th></th>
<th>FY2003</th>
<th>FY2005</th>
<th>FY2006</th>
<th>FY2010</th>
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<tbody>
<tr>
<td>Previous IR presentation</td>
<td>365.0</td>
<td>500.0</td>
<td>690.0</td>
<td>1 trillion yen</td>
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<tr>
<td>Results</td>
<td>386.7</td>
<td>582.2</td>
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</tbody>
</table>

Market Environment and Hitachi’s Approach
6. Business Operation System for ITS Integrated Control

Environment
- Engine control systems
- Motors
- Inverters
- Batteries

Hanshin Electric
Hitachi Vehicle Energy

ITS Integrated Control

Safety
- Brakes
- Steering
- Suspension

Information
- Navigation
- Telematics

Clarion
Xanavi Informatics

Semiconductors,
Functional Materials & Components

Renesas Technology
Hitachi Global Storage Technologies
Hitachi Cable
Hitachi Metals
Hitachi Chemical
Shin-Kobe Electric Machinery
Hitachi Powdered Metals

Market Environment and Hitachi’s Approach

Security

Navigation
Telematics

Renesas Technology
Hitachi Global Storage Technologies
Hitachi Cable
Hitachi Metals
Hitachi Chemical
Shin-Kobe Electric Machinery
Hitachi Powdered Metals

Security

Navigation
Telematics

Renesas Technology
Hitachi Global Storage Technologies
Hitachi Cable
Hitachi Metals
Hitachi Chemical
Shin-Kobe Electric Machinery
Hitachi Powdered Metals
Business Strategy of Automotive Systems Group

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I  Market Environment and Hitachi’s Approach
II Growth Strategies for the Future
III Summary
1. Hitachi’s Strengths and Core Strategies

**Strengths**

- **Expertise active in business**
  - Powertrain systems and vehicle motion management systems technology

- Electronics (electronic control and electric power)
- IT (Car information system devices, services and solutions)
- Advanced parts and materials (Hitachi Group companies)

**Product Technology and Development**

1. Respond to Growth Markets
2. Strengthen Core Businesses
3. Work Toward ITS Integrated Control
4. Strengthen Replacement Parts Business

**Marketing**

1. Strategy by Customer
2. Strategy by Region

**Manufacturing**

1. Strengthen QCDDS
2. Generate Group Synergies

IT: Information Technology
2. Response to Growth Markets

Progression of ITS Society

- Energy issues
  - Reduction of CO2
- Reduction of road traffic accidents
- Reduction of driving stress
  - Telecommunications infrastructure

Growth Markets

- Environment
  - Driving
- Safety
  - Braking
  - Steering
- Information
  - Communicating

Connect
(Make ubiquitous)

Progression of ITS Society

Scope of Hitachi ITS Concept

IT/ITS Market

- Products for Onboard Systems
- Cameras Sensors
- Car navigation
- Control units

Services

- VRM
  - Probe cars
  - Telematics
- Vehicle Movement Management
- Music
- Roadside units
- Traffic congestion prediction
- ETC/Payments
- MOCS
- Transmission of map data

Generate value through collective strengths

Source: Created by Hitachi based on Industry Promotion Study Council on Intelligent Transport System proposal document

ETC: Electronic Toll Collection System
VRM: Vehicle Relationship Management
MOCS: Mobile Operation Control Systems

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3. Strengthen Core Businesses—Environment

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**DI-G System**
(Direct gasoline injection engine management)
High pressure fuel pumps / Injectors / Control units
- Improved fuel efficiency and ease of installation from reduced size and weight
- Injection spray optimized for different engines based on fuel spray analysis technology. Improved fuel efficiency and lower emissions
- High performance and low cost
- Mounted in engine compartment to reduce wire harness

**Sensor Technology**
Airflow sensors, pressure sensors and other sensors
- High degree of resistance to impurities and highly accurate measurement
- Sensing technology to detect driving condition of vehicle using MEMS

**Variable Valve Actuation System**
VEL (Continuous Variable Valve Event and Lift Control System)
VTC (Valve Timing Control System)
- Differentiation by hardware and control system development (reduced size and weight, reduced friction, lower emissions, increased power and torque)
- Increased functionality through combination with DIG system

**Combustion and control simulation technologies**

**MEMS:** Micro Electro Mechanical Systems
Can provide motor, inverter and battery as a system
Use of motor technology developed since Hitachi’s foundation to reduce motor size and weight and increase power
Size and weight reductions through highly reliable, highly efficient, high-density packaging technology as proven in “Shinkansens” bullet trains
Increased power and longer life through use of improved electrode materials

• Reduced fuel costs through use of electromotive system
• Battery-less system allows low weight and low cost

Knowledge of both engine and motor control and capabilities that combine them

Development of core technologies through collaboration within the Hitachi Group

Example: Hitachi Group HEV-related products for GM
Hitachi Cable: Power cable harness and coil magnet wire for drive motor
Hitachi AIC: Printed circuit boards    Renesas Technology: MOSFET, CPU
Hitachi Metals: Normal mode choke coil    NEOMAX: Magnets

MOSFET: Metal-Oxide-Semiconductor Field-Effect Transistor
CPU: Central Processing Unit
6. Strengthen Core Businesses—Safety
7. Strengthen Core Businesses—Safety

**Distinctive Technology**

- **All-azimuth surrounding recognition system**
  - Millimeter-wave radar
  - Image processing camera

- **Vehicle motion management systems**

  **[Steering System]**
  - Hydraulic power steering
  - Electric power steering
  - Steer-by-Wire

  **[Braking System]**
  - Electro mechanical brakes
  - ABS, VDC
  - Brake-by-Wire

  **[Suspension System]**
  - Semi-active suspension
  - Electromagnetic suspension

**Advantages**

- Able to perform 360° sensing using long-range and wide-angle short-range radars combined with a multi-functional single camera and a stereo camera

- Application of latest technology including NVH analysis and materials technology

- Integration with electronic components (control units, sensors)

**Tie-in with outside recognition and drive control technology**

- **Detection**
- **Judgment**
- **Operation**

ABS: Anti-lock Brake System
VDC: Vehicle Dynamics Control
NVH: Noise Vibration Harshness

*Growth Strategies for the Future—Product Technology and Development*

*Ⅱ Growth Strategies for the Future—Product Technology and Development*

*7. Strengthen Core Businesses—Safety*

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  - Millimeter-wave radar
  - Image processing camera

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- **Operation**

ABS: Anti-lock Brake System
VDC: Vehicle Dynamics Control
NVH: Noise Vibration Harshness
8. Strengthen Core Businesses—Information
**Distinctive Technology**

- **Cooperative control navigation system**
  - Highly accurate locating of vehicle position
  - On-demand map data gap updating

- **Multi-functional audio-visual navigation system**
  - Traffic congestion prediction
  - Telematics

- **VRM System**
  - Preventive diagnosis of vehicle malfunction
  - Support for fuel-efficient driving

**Advantages**

- **VRM System**
  - Can perform preventive diagnosis of vehicle malfunction and support fuel-efficient driving by analyzing driving characteristics of the driver, vehicle control, driving condition and so on
  - Know-how of system building requirements (e.g. parts for vehicle control systems, onboard terminals, telematics portal business, corporate information and communication systems)

- **Tie-in with outside recognition system**
- **Updating of map data and high precision vehicle location**

- **Multi-functional navigation with multimedia capability for audio-visual**
- **HMI (Human-Machine Interface) building capability**
- **Provision of highly reliable information including telematics and traffic congestion prediction**
- **Configure to Order Platform**

VRM: Vehicle Relationship Management
The core technologies for Listening, Looking, Sensing, Steering, Braking and Driving are integrated and controlled by linking to the Thinking control technology through a highly reliable communication network. Thus we can realize the goals of Pollution-Free, Hazard-Free and Stress-Free driving experience.
Unity Operation With Hitachi Mobile

Global Business Structure for Replacement Parts

- Promote region-specific strategies
- Make rebuilt parts a new product line

North America: Develop new sales channels
Europe: Start up business making the most of European network of bases
China: Increase sales by making the most of local service network

Expand New Service Network: PitCom

- Service center to deal with electric powered and electronically controlled cars
- Strengthen marketing and enhance services

Fiscal 2006 (actual): 20 centers
Fiscal 2007 (target): 2 centers in each prefecture in Japan (80 nationwide)

Expand Replacement Parts Business Centered on Hitachi Diagnostic Monitor

- Compatible with advanced OBD systems

OBD: On Board Diagnostic

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12. Strategy by Customer

Basic Strategy
Expand sales to global customers through a market-oriented approach

Basic Initiatives
- Build partnerships with customers with advance development
- Make proposals using the Hitachi Group’s cutting-edge technology and products

Sales Breakdown by Customer (FY2005 Actual)
- Renault/Nissan 45%
- GM Group includes Opel and Saab
- Toyota Group includes Subaru
- Ford Group includes Mazda
- Isuzu 3%
- Honda 3%
- Suzuki 2%
- Other 28%
- GM Group 5%
- Toyota Group 8%
- Ford Group 6%
## 13. Strategy by Region -1

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Bases</th>
<th>Number of Companies</th>
<th>Basic Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>10</td>
<td>12</td>
<td>Maintain and increase competitiveness by strengthening region-specific capabilities (development, sales, manufacturing)</td>
</tr>
<tr>
<td>Asia</td>
<td>14</td>
<td></td>
<td>Increase orders received for specific products</td>
</tr>
<tr>
<td>China</td>
<td>12</td>
<td></td>
<td>Aggressively expand sales in the growing markets, using the bases for global production</td>
</tr>
<tr>
<td>Japan</td>
<td>34</td>
<td></td>
<td>Quickly establish a business base using alliances and other approaches</td>
</tr>
<tr>
<td>Americas</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number of bases: Total of 82 companies related to the Automotive Systems Group.

### Basic Strategy

Expand global business in a way that meets the characteristics and needs of each region.
14. Strategy by Region -2

Expand network of development, manufacturing and sales bases in major regions

- Europe: 10 bases
- China: 12 bases
- Asia: 14 bases
- Americas: 12 bases

Number of bases: Total of 82 companies related to the Automotive Systems Group

Overseas Sales Ratio

- FY2005: 41% Overseas, 59% Japan
- Fiscal 2010 (target): At least 50% Overseas, 50% Japan

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### Growth Strategies for the Future—Manufacturing

#### 15. Strengthen QCDDS

<table>
<thead>
<tr>
<th>Quality</th>
<th>Improve customer satisfaction by constant improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>Establish stable, high profit cost structure</td>
</tr>
<tr>
<td>Delivery</td>
<td>Build an optimal global production network</td>
</tr>
<tr>
<td>Development</td>
<td>Promote development of advanced technology</td>
</tr>
<tr>
<td></td>
<td>(establish new Group research laboratory)</td>
</tr>
<tr>
<td>Speed</td>
<td>Increase speed of Group management, development and manufacturing</td>
</tr>
</tbody>
</table>

- Develop global human resources
- Promote CSR activities
- Maintain safety
16. Generate Group Synergies

Vertical Synergy

Horizontal Synergy

[Social Infrastructure Business]
- Power Systems
- Railway Systems
- Government Systems

[Industrial Infrastructure Business]
- Automotive Systems
- Industrial Systems
- Financial Systems

[Life Infrastructure Business]
- Urban Systems
- Home ICT Systems
- Medical Systems

[Information Infrastructure Business]
- IT Platforms
- System Solutions

[Infrastructure Technology/Products]
- Hitachi Cable
- Hitachi Chemical
- Hitachi Metals
- Renesas Technology
- Hitachi Global Storage Technologies
- Production Engineering Research Laboratory
- Advanced Research Laboratory
- Systems Development Laboratory

[Mechanical Engineering Research Laboratory]
- Hitachi Central Research Laboratory
- Hitachi Research Laboratory
- Research Laboratory Technology

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Summary

1. Goals for Fiscal 2010

- Revenues: 1 trillion yen
- Operating profit ratio: 7%

2. Work Toward ITS Integrated Control

- Expertise (Powertrain systems and vehicle motion management systems technology)
- Electronics (electronic control and electric power)
- IT (Car information system devices, services and solutions)
- Advanced parts and materials (Hitachi Group companies)

Aiming to realize ITS Integrated Control by cooperation and integration of system businesses in the Environment, Safety and Information fields
Cautionary Statement Regarding Forward-looking Statements

Certain statements found in this document may constitute “forward-looking statements” as defined in the U.S. Private Securities Litigation Reform Act of 1995. Such “forward-looking statements” reflect management’s current views with respect to certain future events and financial performance and include any statement that does not directly relate to any historical or current fact. Words such as “anticipate,” “believe,” “expect,” “estimate,” “forecast,” “intend,” “plan,” “project” and similar expressions which indicate future events and trends may identify “forward-looking statements.” Such statements are based on currently available information and are subject to various risks and uncertainties that could cause actual results to differ materially from those projected or implied in the “forward-looking statements” and from historical trends. Certain “forward-looking statements” are based upon current assumptions of future events which may not prove to be accurate. Undue reliance should not be placed on “forward-looking statements,” as such statements speak only as of the date of this document.

Factors that could cause actual results to differ materially from those projected or implied in any “forward-looking statement” and from historical trends include, but are not limited to:

- fluctuations in product demand and industry capacity, particularly in the Information & Telecommunication Systems segment, Electronic Devices segment and Digital Media & Consumer Products segment;
- uncertainty as to Hitachi’s ability to continue to develop and market products that incorporate new technology on a timely and cost-effective basis and to achieve market acceptance for such products;
- rapid technological change, particularly in the Information & Telecommunication Systems segment, Electronic Devices segment and Digital Media & Consumer Products segment;
- increasing commoditization of information technology products, and intensifying price competition in the market for such products, particularly in the Information & Telecommunication Systems segment, Electronic Devices segment and Digital Media & Consumer Products segment;
- fluctuations in rates of exchange for the yen and other currencies in which Hitachi makes significant sales or in which Hitachi’s assets and liabilities are denominated, particularly between the yen and the U.S. dollar;
- uncertainty as to Hitachi’s ability to implement measures to reduce the potential negative impact of fluctuations in product demand and/or exchange rates;
- general socio-economic and political conditions and the regulatory and trade environment of Hitachi’s major markets, particularly, the United States, Japan and elsewhere in Asia, including, without limitation, a return to stagnation or deterioration of the Japanese economy, or direct or indirect restriction by other nations on imports;
- uncertainty as to Hitachi’s access to, or ability to protect, certain intellectual property rights, particularly those related to electronics and data processing technologies;
- uncertainty as to the results of litigation and legal proceedings of which the Company, its subsidiaries or its equity method affiliates have become or may become parties;
- possibility of incurring expenses resulting from any defects in products or services of Hitachi;
- uncertainty as to the success of restructuring efforts to improve management efficiency and to strengthen competitiveness;
- uncertainty as to the success of alliances upon which Hitachi depends, some of which Hitachi may not control, with other corporations in the design and development of certain key products;
- uncertainty as to Hitachi’s ability to access, or access on favorable terms, liquidity or long-term financing; and
- uncertainty as to general market price levels for equity securities in Japan, declines in which may require Hitachi to write down equity securities it holds.

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