15th CLSA Japan Forum 2019

HORIBA, Ltd.

May 21, 2019
Key topics

1. HORIBA’s action to response to Electrification

2. Contribution for the energy industry as a whole
   - Providing effective energy solutions to meet “Well-to-wheel”

3. Semiconductor market trend

4. Anniversary of Foundation
   - 65th anniversary of HORIBA, Ltd.
   - 200 year anniversary of Jobin Yvon in France

5. Management change in 2018

6. Approach to ESG investment
HORIBA, Ltd. 65th Anniversary of Foundation in 2018

Global growth through M&A

- In 1996, ABX S.A. was acquired in France (now HORIBA ABX SAS)
- In 1997, Jobin Yvon S.A. was acquired in France (now HORIBA FRANCE SAS)
- In 2015, MIRA Ltd. was acquired in the U.K. (now HORIBA MIRA Limited)
- In 2018, FuelCon AG. was acquired in Germany (now HORIBA FuelCon GmbH)
- In 2005, MCT (Mechatronics) Business of Carl Scheck AG was acquired in Germany
Jobin Yvon 200th Anniversary of Foundation in 2019

Sharing light and passion
200 years of optical innovation
Product at the Time of Its Startup

HORIBA

Jobin Yvon

pH Meters

Fresnel Lens for a Lighthouse
Contents

■ 2018 Results
■ 2019 Forecast
■ Business Segments Outline
■ Share Holder Return
■ Other Topics
● Financial Data
● Corporate profile
Contents

- 2018 Results
- 2019 Forecast
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- Other Topics
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  - Corporate profile
## Review of 2018

### External Events
- Overheated US-China trade friction
- Intensified Brexit uncertainties
- Tighter automotive emission regulations and electrification trend
- Slowdown in capital spending for semiconductors from the second half of 2018

### Internal Events
- New Management of HORIBA Group started
- Enhanced North American bases (for Semiconductors and Scientific)
- Expanded the Aso factory (for Semiconductors)
- Invested aggressively in battery test technologies, including M&A
- Exceeded ¥200bn in annual sales for the first time
Summary of 2018 Results

Achieved record-highs in sales, profit and dividend

**P&L**
- Increase in sales and profit in Automotive and Semiconductor segments, year-on-year
- Semiconductor sales were weak in the second half of the year due to changes in market conditions

**B/S**
- Total asset were ¥278.1bn, up ¥12.2bn, due to increase in inventory.
- Short-term loans payable were ¥12.0bn, up ¥3.6bn, mainly due to acquisition of FuelCon AG
- Equity ratio: 58.0% (+1.5bp) (Compared to the end of Dec. 2017)

**CF**
- Operating CF: Cash in ¥19.5bn due to growth in profit
- Investing CF: Cash out ¥11.0bn due to capital spending
- Financial CF: Cash out ¥3.2bn due to payment of dividend

Free CF +¥8.5bn
## 2018 Results

(Billions of Yen)

<table>
<thead>
<tr>
<th></th>
<th>2017 Results</th>
<th>Forecast (as of Feb.13)</th>
<th>Forecast (as of Nov.9)</th>
<th>2018 Results</th>
<th>vs 2017</th>
<th>vs Forecast (as of Feb.13)</th>
<th>vs Forecast (as of Nov.9)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales</strong></td>
<td>195.3</td>
<td>210.0</td>
<td>207.0</td>
<td>210.5</td>
<td>+15.1</td>
<td>+0.5</td>
<td>+3.5</td>
</tr>
<tr>
<td><strong>Operating Profit</strong></td>
<td>26.8</td>
<td>29.0</td>
<td>27.5</td>
<td>28.8</td>
<td>+2.0</td>
<td>-0.1</td>
<td>+1.3</td>
</tr>
<tr>
<td><strong>O. P. %</strong></td>
<td>13.7%</td>
<td>13.8%</td>
<td>13.3%</td>
<td>13.7%</td>
<td>-0.0p</td>
<td>-0.1p</td>
<td>+0.4p</td>
</tr>
<tr>
<td><strong>Ordinary Profit</strong></td>
<td>26.6</td>
<td>28.4</td>
<td>26.9</td>
<td>28.3</td>
<td>+1.7</td>
<td>-0.0</td>
<td>+1.4</td>
</tr>
<tr>
<td><strong>Net Income attributable to Owners of Parent</strong></td>
<td>16.2</td>
<td>19.0</td>
<td>20.0</td>
<td>22.3</td>
<td>+6.0</td>
<td>+3.3</td>
<td>+2.3</td>
</tr>
<tr>
<td><strong>USD / JPY</strong></td>
<td>112.16</td>
<td>110.00</td>
<td>110.00</td>
<td>110.44</td>
<td>-1.72</td>
<td>+0.44</td>
<td>+0.44</td>
</tr>
<tr>
<td><strong>EUR / JPY</strong></td>
<td>126.70</td>
<td>130.00</td>
<td>130.00</td>
<td>130.35</td>
<td>+3.65</td>
<td>+0.35</td>
<td>+0.35</td>
</tr>
</tbody>
</table>

*: Record-high
# 2018 Results by Segment

(Billions of Yen)

<table>
<thead>
<tr>
<th>Segment</th>
<th>Sales</th>
<th>Operating Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2017</td>
<td>2018</td>
</tr>
<tr>
<td></td>
<td>Results</td>
<td>Forecast (as of Feb. 13)</td>
</tr>
<tr>
<td>Auto</td>
<td>73.3</td>
<td>79.0</td>
</tr>
<tr>
<td>P&amp;E</td>
<td>17.4</td>
<td>19.0</td>
</tr>
<tr>
<td>Medical</td>
<td>25.1</td>
<td>26.0</td>
</tr>
<tr>
<td>Semi</td>
<td>53.3</td>
<td>58.0</td>
</tr>
<tr>
<td>Scientific</td>
<td>26.1</td>
<td>28.0</td>
</tr>
<tr>
<td>Total</td>
<td>195.3</td>
<td>210.0</td>
</tr>
</tbody>
</table>
Contents

- 2018 Results
- 2019 Forecast
- Business Segments Outline
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- Other Topics
  - Financial Data
  - Corporate profile
## Market Assumptions for 2019

<table>
<thead>
<tr>
<th>Sector</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>Strong appetite for investment in the global automotive sector due to tighter emission regulations mainly in Asia and innovation for electrification &amp; autonomous driving</td>
</tr>
<tr>
<td>P&amp;E</td>
<td>Increase in demand due to tighter environmental regulations in emerging countries</td>
</tr>
<tr>
<td></td>
<td>Recovery in investment in the oil industry</td>
</tr>
<tr>
<td>Medical</td>
<td>Japan: Favorable sales to doctors in private practice</td>
</tr>
<tr>
<td></td>
<td>Overseas: Increase in demand for blood testing equipment in emerging countries</td>
</tr>
<tr>
<td>Semi</td>
<td>Temporary subdued capital spending by semiconductor manufacturers</td>
</tr>
<tr>
<td></td>
<td>Anticipate a pick-up in investment, on the back of robust demand for semiconductor devices from a mid- to long-term perspective</td>
</tr>
<tr>
<td>Scientific</td>
<td>Robust corporate R&amp;D spending</td>
</tr>
<tr>
<td></td>
<td>Accelerating research on new materials for secondary batteries</td>
</tr>
</tbody>
</table>
### Exchange rate

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
<th>2019 Forecast</th>
<th>vs 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USD</strong></td>
<td>112.16</td>
<td>110.44</td>
<td><strong>110</strong></td>
<td>-0.44</td>
</tr>
<tr>
<td><strong>EUR</strong></td>
<td>126.70</td>
<td>130.35</td>
<td><strong>125</strong></td>
<td>-5.35</td>
</tr>
</tbody>
</table>

1 yen O.P. sensitivity for 2019 Forecast (Yen appreciation):

- **USD**: -243 million yen
- **EUR**: -12 million yen
## 2019 Forecast

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>vs 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales</strong></td>
<td>195.3</td>
<td>210.5</td>
<td><strong>218.0</strong></td>
<td>+7.4</td>
</tr>
<tr>
<td><strong>Operating Profit</strong></td>
<td>26.8</td>
<td>28.8</td>
<td><strong>29.0</strong></td>
<td>+0.1</td>
</tr>
<tr>
<td><strong>O. P. %</strong></td>
<td>13.7%</td>
<td>13.7%</td>
<td>13.3%</td>
<td>-0.4p</td>
</tr>
<tr>
<td><strong>Ordinary Profit</strong></td>
<td>26.6</td>
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<td><strong>28.5</strong></td>
<td>+0.1</td>
</tr>
<tr>
<td>Net Income attribute to Owners of Parent</td>
<td>16.2</td>
<td>22.3</td>
<td>20.0</td>
<td>-2.3</td>
</tr>
<tr>
<td>Net profit per share (Yen)</td>
<td>386</td>
<td>529</td>
<td>474</td>
<td>-55</td>
</tr>
<tr>
<td>ROE</td>
<td>11.5%</td>
<td>14.3%</td>
<td>11.9%</td>
<td>-2.4p</td>
</tr>
</tbody>
</table>

* : Record-high

(Billions of yen)
## 2019 Forecast by Segment

<table>
<thead>
<tr>
<th></th>
<th>2018 Results</th>
<th>2019 Forecast</th>
<th>vs 2018</th>
<th>2018 Results</th>
<th>2019 Forecast</th>
<th>vs 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auto</strong></td>
<td>79.6</td>
<td>★ 85.0</td>
<td>+5.3</td>
<td>7.7</td>
<td>★ 9.0</td>
<td>+1.2</td>
</tr>
<tr>
<td><strong>P&amp;E</strong></td>
<td>19.3</td>
<td>★ 20.0</td>
<td>+0.6</td>
<td>2.0</td>
<td>2.0</td>
<td>-0.0</td>
</tr>
<tr>
<td><strong>Medical</strong></td>
<td>26.0</td>
<td>★ 28.0</td>
<td>+1.9</td>
<td>1.8</td>
<td>2.0</td>
<td>+0.1</td>
</tr>
<tr>
<td><strong>Semi</strong></td>
<td>57.7</td>
<td>55.0</td>
<td>-2.7</td>
<td>17.0</td>
<td>15.0</td>
<td>-2.0</td>
</tr>
<tr>
<td><strong>Scientific</strong></td>
<td>27.7</td>
<td>★ 30.0</td>
<td>+2.2</td>
<td>0.2</td>
<td>1.0</td>
<td>+0.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>210.5</td>
<td>★ 218.0</td>
<td>+7.4</td>
<td>28.8</td>
<td>★ 29.0</td>
<td>+1.0</td>
</tr>
</tbody>
</table>

*Record-high*
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2018 Results and 2019 Forecast

2018 Results

- **EMS**: Higher demand in China and India due to new regulations
- **MCT**: One-off expenses, including acquisition costs
- **ECT**: Business expansion in next-gen. automotive technology development

2019 Forecast

- **EMS**: Robust sales in Asia and Europe, increase in investment for achieving greater competitiveness
- **MCT**: Increase in sales in Japan and Europe
- **ECT**: Aggressive investment to accelerate growth

Automotive Sales Breakdown

<table>
<thead>
<tr>
<th></th>
<th>EMS</th>
<th>MCT</th>
<th>ITS</th>
<th>ECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>39.7</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>2016</td>
<td>40.1</td>
<td>13.2</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>2017</td>
<td>45.3</td>
<td>8.0</td>
<td>18.3</td>
<td>1.2</td>
</tr>
<tr>
<td>2018</td>
<td>50.8</td>
<td>18.2</td>
<td>18.2</td>
<td>9.3</td>
</tr>
<tr>
<td>2019 (F)</td>
<td>53.0</td>
<td>21.0</td>
<td>10.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Sales and Operating Profit

<table>
<thead>
<tr>
<th></th>
<th>Sales</th>
<th>O.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>65.4</td>
<td>5.2</td>
</tr>
<tr>
<td>2016</td>
<td>62.2</td>
<td>3.5</td>
</tr>
<tr>
<td>2017</td>
<td>73.3</td>
<td>7.6</td>
</tr>
<tr>
<td>2018</td>
<td>79.6</td>
<td>7.7</td>
</tr>
<tr>
<td>2019 (F)</td>
<td>85.0</td>
<td>9.0</td>
</tr>
</tbody>
</table>

1: Mechatronics 2: Engineering Consultancy & Testing
Effect of enhanced emission regulations

Status of the next-gen. emission regulations
HORIBA BIWAKO E-HARBOR achieved record-high output

- Sales of EMS business
  - 2015: ¥39.8bn  (Before the start of E-HARBOR)
  - 2018: ¥49.0bn (forecast)
  - Up 25%

- Emission regulations

<table>
<thead>
<tr>
<th>Regulation</th>
<th>EU</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLTP¹</td>
<td>Sep. 2017</td>
<td>Oct. 2018</td>
</tr>
<tr>
<td>RDE²</td>
<td>2022 (plan)</td>
<td>2022 (plan)</td>
</tr>
</tbody>
</table>

China and India: Adoption of new regulations in 2020 (plan)
(Same level as Euro6)

1: Worldwide harmonized Light vehicles Test Procedure
2: Real Driving Emissions
Battery evaluation testing facility for electric vehicles (HORIBA BIWAKO E-HARBOR)

- Assessment of the combination of a battery, powertrain, and a vehicle
- Testing a wide range of temperature environment → To be used in evaluating xEV and fuel batteries
- Operation to start in July 2019 (plan)
- Investment amount: about ¥1.3bn

Advanced Battery Development Suite (ABDS) (HORIBA MIRA)

HORIBA MIRA's engineering capability to be deployed globally
Expanding Business Domains (FuelCon Acquisition)

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**Acquisition of FuelCon AG**

- A leading German developer of fuel cell and battery test systems for electric vehicles
- Owns diverse fuel cell test systems
- Supplied systems mainly to German automakers

<table>
<thead>
<tr>
<th>Established</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>11,504k EUR (2017)</td>
</tr>
<tr>
<td>Operating profit</td>
<td>199k EUR (2017)</td>
</tr>
<tr>
<td>Workforce</td>
<td>62 (ex. Management)</td>
</tr>
<tr>
<td>Location</td>
<td>Magdeburg, Germany (About 160km west of Berlin)</td>
</tr>
<tr>
<td>Major customers</td>
<td>Volkswagen, BMW, Audi, Hyundai, Bosch</td>
</tr>
</tbody>
</table>

**HORIBA Group’s expansion of business domains**

- **Vehicle**
  - Measuring instruments (EMS/MCT)
    - HORIBA
  - Test automation
    - HORIBA
  - Engineering (ECT)
    - MIRA

**Use of FuelCon’s experience and know-how to expand electric vehicle business**
More solutions, addressing electrification challenges

**Acquisition of FuelCon AG (Germany) to strengthen battery test business**

【Main business】
Development and production of fuel cell and battery test systems for electric vehicles

【Major customers】
Volkswagen, BMW, Audi, Hyundai, Bosch, etc.

【Sales breakdown】
Battery test systems: 23%
Fuel cell test systems: 77%
*Results of the 4th Quarter, 2018

Accelerate business growth in electric vehicle development

**Open an advanced lab for vehicle electrification**

HORIBA BIWAKO E-HARBOR Cell Zero

【Planned start, July 2019】

1) Cell 0: Adopting technologies of FuelCon and MIRA
2) Cell 1-3: Powertrain and vehicle test systems (in operation)

Enabling total powertrain simulation → Completing HORIBA’s unique evaluation and test facility
Expanding Business Domains (Support to the UCI)

Support to the UCI for a new institute

- Committed support to the University of California, Irvine (UCI) to establish the Horiba Institute for Mobility and Connectivity (HIMAC)
- Enhance industry and academia partnering in the energy sector of the UCI, a credible institute recognized by the Environmental Protection Agency (EPA) and other U.S. regulatory authorities

HORIBA Group’s expansion of business domains

- Mobility field
- Energy field
- Integration

Provision of measurement instruments

【HIMAC】
Combine energy and mobility fields
Research and education efforts on integrated systems

A place for research and education

University of California, Irvine
Industry-academia tie-up to respond to change in the automotive industry

Contributing to boosting efficiency in the accelerated simulation-based automotive development

- Improve development of test equipment allowing to verify effects before making prototypes

Collaboration in test equipment development

HORIBA

Technische Universität Dresden (Germany)

Promoting development of connected /autonomous driving technology

- Ensure safety against cyber attacks
- Test/evaluate high-speed autonomous driving of more than one vehicle

Launch of a new autonomous driving test facility (in 2020)

Coventry University (UK)

HORIBA

MIRA

Invest in and provide (rent) test equipment

Provide academic know-how

Provide academic know-how

Invest in and provide test equipment
2018 Results

+ 【Stack gas analyzers / Process measurement equipment】
  Sales increase in North America by sales efforts

+ 【Air quality monitoring】
  Demand growth in emerging countries due to enhanced regulations

+ 【Water quality monitoring】
  Sales increase due to business growth in Asia

2019 Forecast

+ 【Stack gas analyzers / Air quality monitoring】
  Anticipate recovery in Japan and tighter regulations in Asia

+ 【Process measurement equipment】
  Anticipate continued recovery in investment by customers

+ 【Water quality monitoring】
  Expand more business growth in emerging countries

Sales and Operating Profit

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales</th>
<th>O.P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>16.7</td>
<td>1.7</td>
</tr>
<tr>
<td>2016</td>
<td>16.7</td>
<td>1.5</td>
</tr>
<tr>
<td>2017</td>
<td>17.4</td>
<td>1.0</td>
</tr>
<tr>
<td>2018</td>
<td>19.3</td>
<td>2.0</td>
</tr>
<tr>
<td>2019</td>
<td>20.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Supplied water quality analyzers (tap water) to Kuala Lumpur
Received repeat orders in 2019
Promote localization for business expansion

Localization according to trends in developed/emerging markets yields good results

【Germany】
Enhance manufacturing/sales
Record shipment of pollution measurement units in Europe

【China, Asia】
Promote dev’t/engineering; enhance sales
Tighter environmental regulations raised need for measurement equipment
【Water quality measurement】
Automatic total nitrogen, phosphorous measurement equipment

【USA】
Enhance sales/product dev’t
Greater enhanced process measurement equipment business

Systemization of measurement equipment in oil refining process and bundle sales

【India】
Enhance engineering
Demand increase for stack gas analyzers; local production and sales

Stack gas analyzer

Aim at solidifying HORIBA’s position in global business
2018 Results and 2019 Forecast

2018 Results

+ Strong sales of hematology analyzers in China and India
+ Increase in R&D expenses for achieving greater competitiveness
+ Acquisition of a micro-blood analysis system business to expand the product line-up

2019 Forecast

+ Aim at growth in sales by promoting new products to achieve greater results despite intensified competition in hematology and CRP analyzers in Japan
+ Increase in R&D expenses for business expansion (i.e., micro-blood analysis system business)

Latest test system
Solution
(Launched in 2017)

Operation of the large-scale testing centers in the UK and Brazil (Photo from Brazil)

Sales and Operating Profit

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (Billions of yen)</th>
<th>O.P. (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>27.6</td>
<td>2.5</td>
</tr>
<tr>
<td>2016</td>
<td>26.5</td>
<td>2.8</td>
</tr>
<tr>
<td>2017</td>
<td>25.1</td>
<td>1.9</td>
</tr>
<tr>
<td>2018</td>
<td>26.0</td>
<td>1.8</td>
</tr>
<tr>
<td>2019</td>
<td>28.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>
Initiatives for business expansion

Medical

New products to be launched globally

Mid and large-sized new product “HELO Solution”
Completed installation in France, Brazil, Thailand and the U.K.

5 diff. white cell diagnosis + CRP “Yumizen H630”
Favorable sales to doctors in private practice in Japan

Business alliance with Siemens Healthcare Diagnostics
In the process of arranging products for obtaining accreditation

Installation case in Brazil

Opened the application center (biochemical) to accelerate the U.S. business

➢ To start full operation in August 2018 in Irvine, California
➢ For application development in the biochemical field
➢ Biochemical business consolidated sales: ¥4.1bn(2017)

Biochemical analytical equipment to be launched in the U.S. (OEM supply from JEOL Ltd.)
Medical

Broaden technologies and product functions

Acquisition of a micro-blood analysis system business from Rohm Co., Ltd.

【Main business】
Development of μTAS\(^1\) technology, which uses micro processing technology of electronic components

【Technology characteristics】
Enable offering of compact products that measure CRP\(^2\) and HbA1c\(^3\) at low cost

1: Micro Total Analysis System
2: C-Reactive Protein, a representative inflammatory marker
3: Hemoglobin A1c that indicates blood-sugar levels of the past 1-2 months

【Business evolution by test category】

<table>
<thead>
<tr>
<th>Test Category</th>
<th>Clinical Chemistry</th>
<th>Hematology</th>
<th>Immunology</th>
<th>Coagulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market size</td>
<td>2tn yen</td>
<td>350bn yen</td>
<td>2tn yen</td>
<td>200bn yen</td>
</tr>
<tr>
<td>Hospitals</td>
<td>Large hospitals</td>
<td>Testing centers</td>
<td>Small and medium-sized hospitals</td>
<td></td>
</tr>
<tr>
<td>Private practitioners</td>
<td>Clinical chemistry</td>
<td>Small/medium-sized hematology analyzers</td>
<td>CRP</td>
<td>Small/medium-sized coagulation</td>
</tr>
</tbody>
</table>

Expand a line-up in the POCT category (focus on clinical-chemical and immunology)
Broader portfolio → Higher shares in tests in hospitals market

Broader functions of products help solve social challenges

HORIBA’s hematology analyzers have additional function of Malaria infection screening

➢ Reduction in test processes in malaria infection testing
➢ Cheaper than purchase of new equipment

SDGs advocate eliminating malaria.

Fight Malaria + Grow business

(Market sizes by HORIBA’s estimates)
**2018 Results**

- Record-high sales and operating profit
- Boosted supply and enhanced development capability by the Aso factory expansion and opening of HORIBA Reno Technology Center (USA)
- Slowdown in the second half due to semiconductor makers’ temporary investment adjustment

**2019 Forecast**

- Expect semiconductor makers’ investment to be in an adjustment phase in the first half but to pick up in the second half due to mid- to long-term solid demand

---

**HORIBA STEC’s 45th anniversary**

Launched Japan’s first mass flow controllers in 1980

Grew to achieve a global high 60%* share

* HORIBA’s estimate for 2019

---

**Sales and Operating Profit**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (Billions of yen)</th>
<th>Operating Profit (Billions of yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>9.4</td>
<td>15.6</td>
</tr>
<tr>
<td>2016</td>
<td>9.6</td>
<td>17.0</td>
</tr>
<tr>
<td>2017</td>
<td>35.3</td>
<td>53.3</td>
</tr>
<tr>
<td>2018</td>
<td>38.8</td>
<td>57.7</td>
</tr>
<tr>
<td>2019 (F)</td>
<td>55.0</td>
<td></td>
</tr>
</tbody>
</table>

Launched Japan’s first mass flow controllers in 1980

Grew to achieve a global high 60%* share

* HORIBA’s estimate for 2019
Strengthen supply capacity and global R&D

Full-fledged production after the Aso expansion

**Combined output at Aso and Kyoto**
350,000 MFCs per year

Production status: Record-high output (March 2018)
Aso Factory: Mass production of MFCs
Kyoto Factory: Development and production of advanced MFCs

Opening of HORIBA Reno Technology Center

**Enhance a N. America development base in the focus area**

**Establish a global R&D capability**

Start: Aug. 2018
Investment: App. ¥1.2bn
Place: Reno, Nevada, the U.S.
Activity: Development in fluid measurement and control technologies

HORIBA’s global MFC market share: About 60% (HORIBA’s estimate; as of 2018)

HORIBA STEC Aso Factory
Construction completion ceremony (May 2018)

HORIBA Reno Technology Center's surroundings
Expand business to cover the entire semiconductor manufacturing process

Diverse product line-up contributing to the overall semiconductor manufacturing process

<table>
<thead>
<tr>
<th>Material assessment</th>
<th>Manufacturing process</th>
<th>Quality control and waste water treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials Analysis</strong></td>
<td><strong>Dry Process</strong></td>
<td><strong>Utility/Wastewater</strong></td>
</tr>
<tr>
<td>Cathodoluminescence measurement system (assessment of compound semiconductors)</td>
<td>Mass flow controller (Precision enhancement in the etching process)</td>
<td>pH meter</td>
</tr>
<tr>
<td>Raman spectrometer (next-gen. semicon material assessment)</td>
<td>Chemical concentration monitor (high-precision measurement of chemicals)</td>
<td>Industrial water quality analyzer</td>
</tr>
<tr>
<td><strong>Device Analysis</strong></td>
<td><strong>Wet Process</strong></td>
<td>(Appropriate pure water/wastewater control within a factory)</td>
</tr>
<tr>
<td><strong>Lithography</strong></td>
<td></td>
<td><strong>Water-related business</strong></td>
</tr>
<tr>
<td>Reticle/mask particle detection systems (quality enhancement of exposure process)</td>
<td></td>
<td><em>Typical product example</em></td>
</tr>
</tbody>
</table>
2018 Results and 2019 Forecast

2018 Results

- Sales increase in Japan and Europe on the back of robust corporate R&D spending
- Recognized expenses to enhance bases in the Americas

2019 Forecast

- Anticipate sales increase in the Americas due to production capacity growth
- Expect solid demand to continue in Japan and Europe
- Enhance actions for business expansion in secondary batteries

New product launched in 2018
X-ray analytical microscope XGT9000

- More accurate defect and foreign material analysis of products
- Non-destructive, non-contact

Can be used in analysis of lithium ion batteries, semiconductor ICs, foods, and drugs

Sales and Operating Profit

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (Billions of yen)</th>
<th>O.P. (Billions of yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>26.7</td>
<td>1.1</td>
</tr>
<tr>
<td>2016</td>
<td>25.7</td>
<td>0.9</td>
</tr>
<tr>
<td>2017</td>
<td>26.1</td>
<td>0.4</td>
</tr>
<tr>
<td>2018</td>
<td>27.7</td>
<td>0.2</td>
</tr>
<tr>
<td>2019</td>
<td>30.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>
Expand core business and contribute to technology innovation

Acquisition of MANTA Instruments Inc. to obtain new technology

- Acquired this U.S. start-up company that develops, manufactures and sells nanoparticle measurement instrument, in January 2019.
- High reputation; has patents in related technology

MANTA Instruments, Inc.
- Located in San Diego
- Established September 2014
- Six employees

ViewSizer3000
Used in life science, and for semiconductor, drugs, foods, cosmetics, catalysts and secondary batteries

Aim at expanding the particle measurement instrument business

Contributing to technology innovation

- Prof. Gérard Mourou, who was awarded the 2018 Nobel prize in physics, has been a long-time user of HORIBA’s grating.

HORIBA’s grating was selected to be exhibited at the Nobel Prize Museum

HORIBA’s meter-size grating
Core analytic technology supports cutting-edge progress

20 years of technological integration of HORIBA and Jobin Yvon and new market development

HORIBA celebrates 65th anniversary

HORIBA’s strengths in measurement instruments for industry

Jobin Yvon’s strengths in products for scientists and advanced research

Scientific segment

Prominent as developer of unique markets; functioning as an incubator of HORIBA business

Scientific

Automotive

Process & Environmental

Medical

Semiconductor
Contents

- 2018 Results
- 2019 Forecast
- Business Segments Outline
- Share Holder Return
- Other Topics
  - Financial Data
  - Corporate profile
**Shareholder Return**

### Basic policy
- Dividend payment + Share buyback = 30% of Consolidated net profit to be targeted
- Remaining earnings are retained internally for strategic investment (i.e. facilities, M&A)

### Dividends per share and Share buybacks
- **2017 Results** 116yen [Interim 40yen/Year-end 76yen]
- **2018 Results** 145yen [Interim 50yen/Year-end 95yen]
- **2019 Forecast** 130yen [Interim 50yen/Year-end 80yen]

### Per-share dividend (from 2004 to 2019 Forecast)

- **Ordinary dividend:** 125yen
- **Commemorative dividend** for the 65th anniversary of the company foundation: 20yen

**Renewed record-highs in dividend in 9 years**
Contents

- 2018 Results
- 2019 Forecast
- Business Segments Outline
- Share Holder Return
- Other Topics
  - Financial Data
  - Corporate profile
HORIBA’s perspectives on ESG investment

Contribution to the environment and society via its business;
Building of an open & fair governance structure

【Examples】

**ESG ENVIRONMENT**

Emission gas measurement system
Contribute to emission regulations, realizing healthy society, preventing climate change

Environment-related products
Contribute to environmental preservation and improvement by identifying causes of pollutions via analysis of air pollutants and industrial waste

**ESG SOCIAL**

Innovation for electrification & autonomous driving
Help realize safe, pleasant society

MIRA Technology Institute
Contribute to industries’ development by developing next-gen. talents

Aso factory’s expansion
Contribute to local communities and continuous job creation

**ESG GOVERNANCE**

Outside Directors with diverse experiences and skills
Raise the quality of strategies by making decisions upon active discussions at the Board of Directors and corporate value

Sawako Takeuchi
Academic background as a holder of a doctor’s degree in engineering and international experience

Masahiro Sugita
Deep insight and knowledge on finance and economy, and accumulated experience as a director and auditor of other companies

Jiko Higashifushimi
Insight as Head Priest of the Shorenin Religious Corporation and work experience at a financial institution
“HORIBA Premium Value” to improve asset efficiency

Case of an improved asset efficiency in the MCT business

- Improvement at Olomouc Factory (Czech) with a focus on production of standard Chassis dynamometers
- Full review of production processes and supply chain and adoption of the Kanban pull system

25% cut in production lead-time

Workshops on adoption of a new benchmark

- Action plan for those responsible in global finance
- Workshops for managers
  - Action plan (examples)
    - Promoting the benchmark to all group employees
    - Optimization of group inventory by sharing inventory information
    - Building of a sales company-factory cooperative structure for collection of receivables

Olomouc Factory (left) and its production area (right)

HORIBA Premium Value

A new management benchmark with awareness on WACC

O.P. = Cost of capital

\[
\text{Cost of capital} = \frac{\text{Invested capital} \times \text{In-house rate of cost of capital}}{}
\]
Workplace-rooted Workstyle Renovation

<table>
<thead>
<tr>
<th>Stained Glass Project</th>
<th>Introducing “Good Place” work system</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1 in 2014</strong></td>
<td><strong>Allowing flexible workstyle and aiming at capable employees to continue working</strong></td>
</tr>
<tr>
<td>Initial focus on engagement of women at workplace</td>
<td>✓ Allows work other than home</td>
</tr>
<tr>
<td><strong>Step 2 from 2015</strong></td>
<td>✓ No limit to work-at-home days</td>
</tr>
<tr>
<td>Start “work style renovation” workshop</td>
<td>A guideline is made and used by each team</td>
</tr>
<tr>
<td>Theme: Change in individual behavior</td>
<td>Experience of the Telework Days* is reflected in the “Good Place” work system.</td>
</tr>
<tr>
<td><strong>Step 3 from 2016</strong></td>
<td>*The Japanese government’s initiative calling to participate a nation-wide remote working campaign on certain days</td>
</tr>
<tr>
<td>Organize a dedicated team to connect the management, HR team and workplaces</td>
<td>Opened a website to present diversity-related initiatives</td>
</tr>
<tr>
<td>Activities to make the best use of characteristics of each workplace/organization</td>
<td><a href="http://www.horiba.com/diversity/">http://www.horiba.com/diversity/</a></td>
</tr>
</tbody>
</table>

Opened a website to present diversity-related initiatives

http://www.horiba.com/diversity/
Awarded Nadeshiko Brands and Health & Productivity Stock Selection Program by METI and Tokyo Stock Exchange

Activities aimed at realizing a better working environment highly evaluated from the stock market

Evaluated the engagement based on our Diversity promotion activities "HORIBA Stained Glass Project"


Evaluated our activities based on the “Health promotion activities of mind and body“, the policy declared by the management

Contents

- 2018 Results
- 2019 Forecast
- Business Segments Outline
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Operating Profit Analysis (vs 2018)

(Billions of yen)


26.8

Increase Sales +14.5
Increase Cost of Goods sales -7.9
Exchange Impact for gross Profit -0.02
Exchange Impact for Expenses -0.1
Increase R&D Cost -1.1
Increase Other Expense -3.3


28.8

Increase of Operating Profit +2.0
Increase Expenses -4.4
Exchange Impact -0.1
Increase Gross Profit +6.6
### Impact of Fluctuation in Foreign exchange ( Millions of yen)

#### Exchange rate impact (2018 result)

<table>
<thead>
<tr>
<th>Category</th>
<th>Sales (¥mn)</th>
<th>O.P. (¥mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>+579</td>
<td>-182</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>Sales (¥mn)</th>
<th>Operating Profit (¥mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>+581</td>
<td>-11</td>
</tr>
<tr>
<td>P&amp;E</td>
<td>+5</td>
<td>+29</td>
</tr>
<tr>
<td>Medical</td>
<td>+117</td>
<td>+8</td>
</tr>
<tr>
<td>Semi</td>
<td>-228</td>
<td>-338</td>
</tr>
<tr>
<td>Scientific</td>
<td>+104</td>
<td>+19</td>
</tr>
<tr>
<td>Total</td>
<td>+579</td>
<td>-182</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>USD</th>
<th>EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>-177</td>
<td>+586</td>
</tr>
<tr>
<td>Sales</td>
<td>-11</td>
<td>-41</td>
</tr>
<tr>
<td>Operating</td>
<td>+56</td>
<td>+27</td>
</tr>
</tbody>
</table>

*Total is not matching with sum-up of each content due to other small currency effect.*

#### Exchange rate impact for 2019 Forecast

1 yen impact of Sales and O.P.

(Yen appreciation)

<table>
<thead>
<tr>
<th>Category</th>
<th>Sales (¥mn)</th>
<th>Operating Profit (¥mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD</td>
<td>-489</td>
<td>-243</td>
</tr>
<tr>
<td>EUR</td>
<td>-373</td>
<td>-12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(JPY)</th>
<th>2017 Result</th>
<th>2018 Result</th>
<th>2019 Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD</td>
<td>112.16</td>
<td>110.44</td>
<td>110.00</td>
</tr>
<tr>
<td>EUR</td>
<td>126.70</td>
<td>130.35</td>
<td>125.00</td>
</tr>
</tbody>
</table>
# Capital Investment, Depreciation, R&D

## (Billions of yen)

<table>
<thead>
<tr>
<th></th>
<th>2017 Result</th>
<th>2018 Previous Forecast (as of Nov 9)</th>
<th>2018 Result</th>
<th>2018 vs 2017</th>
<th>2018 vs Previous Forecast</th>
<th>2019 Forecast</th>
<th>2019 vs 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Investment</td>
<td>11.6</td>
<td>14.0</td>
<td>10.2</td>
<td>-1.3</td>
<td>-3.7</td>
<td>16.0</td>
<td>+5.7</td>
</tr>
<tr>
<td>Depreciation</td>
<td>7.5</td>
<td>7.5</td>
<td>7.2</td>
<td>-0.2</td>
<td>-0.2</td>
<td>7.5</td>
<td>+0.2</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>13.9 (To Net Sales)</td>
<td>15.5</td>
<td>15.1</td>
<td>+1.2</td>
<td>-0.3</td>
<td>16.0</td>
<td>+0.8</td>
</tr>
</tbody>
</table>

(To Net Sales) 7.1% 7.5% 7.2% 0.1% -0.3% 7.3% 0.1%

<table>
<thead>
<tr>
<th>2018 Topics</th>
<th>-PP&amp;E</th>
<th>Depreciation</th>
<th>R&amp;D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhancement of North American bases / Investment to MIRA / Enhancement of global bases</td>
<td>Decrease goodwill of MIRA, + Increase by new investment</td>
<td>Increase in Automotive segment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2019 Topics</th>
<th>-PP&amp;E</th>
<th>Depreciation</th>
<th>R&amp;D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in investment in automotive-related facilities and enhancement of global bases</td>
<td>Increase by new investment</td>
<td>Increase in Automotive and Semiconductor segments</td>
<td></td>
</tr>
</tbody>
</table>
## Consolidated Cash Flows

(Billions of yen)

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2017</th>
<th>Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash flows from operating activities</td>
<td>+19.5</td>
<td>+28.2</td>
<td>-8.7</td>
</tr>
<tr>
<td>Cash flows from investing activities</td>
<td>-11.0</td>
<td>-13.1</td>
<td>+2.1</td>
</tr>
<tr>
<td>Cash flows from financing activities</td>
<td>-3.2</td>
<td>-9.0</td>
<td>+5.8</td>
</tr>
<tr>
<td>Cash and cash equivalents at end of year</td>
<td>+62.8</td>
<td>+58.3</td>
<td>+4.5</td>
</tr>
<tr>
<td>Free cash flows</td>
<td>+8.5</td>
<td>+15.1</td>
<td>-6.6</td>
</tr>
</tbody>
</table>
Cash Balance

- Loan repayment due to group financing

*1 Cash*…Cash and Cash Equivalents at End of Period. *2 JBIC: Japan Bank for International Cooperation
Business Segments

Sales Breakdown by Segment

Sales: ¥210.5bn (1,897MUSD)

<table>
<thead>
<tr>
<th>Segment</th>
<th>%</th>
<th>Sales in MUSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive</td>
<td>38%</td>
<td>79.6 (717)</td>
</tr>
<tr>
<td>Semicon</td>
<td>27%</td>
<td>57.7 (520)</td>
</tr>
<tr>
<td>Medical</td>
<td>12%</td>
<td>26.0 (234)</td>
</tr>
<tr>
<td>P&amp;E</td>
<td>10%</td>
<td>19.3 (174)</td>
</tr>
<tr>
<td>Scientific</td>
<td>13%</td>
<td>27.7 (250)</td>
</tr>
<tr>
<td>Semiconductor</td>
<td>13%</td>
<td>5.7 (520)</td>
</tr>
</tbody>
</table>

( ) = Segment Sales in MUSD
% = Segment Sales Ratio

(Sales of FY2018)
HORIBA Worldwide

Sales of FY2018: ¥210.5bn
(1,897 MUSD)

The Number of Group Companies by region
(As of December 31, 2018)

<table>
<thead>
<tr>
<th>Region</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americas</td>
<td>9</td>
</tr>
<tr>
<td>Europe</td>
<td>22</td>
</tr>
<tr>
<td>Asia</td>
<td>18 (4 in Japan, including HORIBA, Ltd.)</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
</tr>
</tbody>
</table>
Employees by Region

(As of December 31, 2018)

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage</th>
<th>Total Number of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>38%</td>
<td>7,943</td>
</tr>
<tr>
<td>Total Asia</td>
<td>55%</td>
<td>4,315</td>
</tr>
<tr>
<td>Total Europe</td>
<td>33%</td>
<td>2,637</td>
</tr>
<tr>
<td>Total Americas</td>
<td>12%</td>
<td>991</td>
</tr>
<tr>
<td>Other Europe</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Other Asia</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>The U.K.</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>The U.S.</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

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Continuous growth in Sales/Operating Profit/Net Income

Growth in two times for 10 years from 2010

Sales
Operating Profit
Net Income

2001-2005
2006-2010
2011-2015
2016-2020

2015→2020
CAGR: 7.8%

2015→2020
CAGR: 8.3%

2015→2020
CAGR: 8.5%

Billions of yen

[Ref.] Business results trend for 20 years/Targets/Progress of MLMAP

Operating Profit 2015→2020
CAGR: 8.3%

Net Income 2015→2020
CAGR: 8.5%

Sales
Operating Profit
Net Income

Continuous growth in Sales/Operating Profit/Net Income

Growth in two times for 10 years from 2010
Biwako factory “HORIBA BIWAKO E-HARBOR”

- Consolidating development, design, and production operations of gas measurement equipment at a single location
- Doubling of production capability and shortening delivery time to one-third by using a new production methodology
- Comprehensive engineering services from sales to development, production, and maintenance in the Automotive testing laboratory

Profitability improvement of exhaust gas analyzers
Presenting cutting edge automotive development technology

Total investment: 10.0 billion yen, Location: Otsu City, Shiga Prefecture, Full operation: May 2016
Global convergence of emission regulations

- Accelerating introduction of unified emission regulations (US and EU in 2017, Japan in 2018)
- Need to upgrade equipment due to change in testing method

- **Bench test in labs**
  - Need to upgrade exhaust gas analyzers (hardware and software)
  - Demand for more number of units

- **On-road test (RDE: Real Driving Emission)**
  - Regulation for Light Duty Vehicles to start in Sep. 2017 in EU
  - Need to coordinate data with lab test results
    - Correlate analyzers = Coordinate "MEXA" with "OBS" series
    - Expand HORIBA MIRA’s testing business

PEMS
(Portable Emission Measurement Systems)
Response to Automotive Electrification

E-LAB at HORIBA BIWAKO E-HARBOR
Information on page 59 to 68 are as of acquired the company.
Overview of MIRA Ltd.

Business
1. Engineering Consultancy
2. Testing Services & Consultancy
3. MIRA Technology Park (Lease R&D facilities)

Results
Sales : 46.1MGBP (2014 Results)
O.P. : 1.1MGBP (2014 Results)

Employees
518 (As of December 31, 2014)

Established
1946

Head office
Nuneaton, Warwickshire, UK

Main sites
UK, China, India, Brazil
Core business streams

Engineering Consultancy

◆ Sales: 20MGBP  Number of employee: 240
  ✓ Design and development for vehicle driving performance
    (Brake performance, electromagnetic compatibility performance)
  ✓ Development services utilizing automatic driving and remote control technology

Testing Services & Consultancy

◆ Sales: 22MGBP  Number of employee: 180
  ✓ Testing and homologation services for collision safety, electromagnetic compatibility, functional safety and other vehicle related performance
  ✓ MIRA has the capability for a range of type approval testing, delegated by public authority

MIRA Technology Park (Lease R&D facilities)

◆ Sales: 3MGBP  Number of employee: 20
  ✓ Rent R&D facilities to 30 Auto/Auto related company
  ✓ Granted Enterprise Zone* status by the UK government

* Enterprise Zones
A Companies in Enterprise Zones have access to a number of benefits, including tax concessions and grants
2014 Results

Sales by Business field:
- Engineering Consultancy: 20MGBP (44%)
- Testing Services & Consultancy: 22MGBP (49%)
- MIRA Technology Park: 3MGBP (6%)
- Others

Sales by Region:
- UK: 80%
- Europe: 8%
- Americas: 3%
- China: 5%
- Korea: 2%
- India: 1%
- Other Asia: 1%
- Other:

Total Sales: 46.1MGBP
Engineering Consultancy

It could cover all domains of Vehicle R&D

Vehicle Engineering

Controls & Next generation EV

Functional Safety

Future Transport Technologies
MIRA Technology Park

Various experiments using a large test course

- Proving ground
  - Performance (4.5km)
  - Off road
  - Wet surface
  - City Circuit
  - Noise-Generating
  - Ride & Durability

- Transmission test
- Braking systems
- Tire development
- Durability

Test Site
“35” Test Site
Wind Tunnels (3)/EMC (9)/Crash lab/NVH Chassis/Battery test

MIRA Technology Park
30 customers
MIRA Technology Park

Key Aspects:

- Renting space to customers who want to be on site, ranging from day rates for workshop units to long term leases for bespoke dedicated R&D facilities
- Total number of tenants: 30
- Locations: UK

Key Customers & Markets:

- Major OEM’s and Tier One suppliers from around the world
- Tenants are attracted from global companies that want to access European technology and the European transportation market
Location of MIRA

- MIRA was strategically located in the Midlands, the center of the UK automotive industry
  - This area is famous for advanced vehicle engineering incl. F1 teams, and many skilled resource (Mercedes, McLaren, Lotus, Williams etc.)
- Independent from any automotive manufacturers
- Strong support from UK and local government

Major customers:
Aston Martin, Ford, Jaguar Land Rover, HKMC (Hyundai Kia Motor Company) and Japan Auto maker
Future vision of HORIBA, Ltd. and HORIBA MIRA Ltd.

Shared Vision: **Contribute to Global Sustainable Mobility**

**Challenges currently faced**

**Access to latest vehicle technology and R&D information**

**Become ready for changing powertrain and future mobility**

**Grow in the global market**

**Maximize use of key technologies, facilities, and human resources**

**Synergy**

**Short term**

- Create added value in EMS/MCT business
- Enhance software development and accumulate R&D-related information

**Long term**

- Expand the Automotive business domain
- Develop next-generation mobility systems

**Short term**

- Utilize HORIBA's advanced measurement devices so as to benefit each business

**Long term**

- Grow in the global market
- Expand the customer base
Expand business portfolio

Provide comprehensive solution of Automotive R&D

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*PWT: Powertrain
HORIBA’s analytical and measurement technologies contribute to the entire energy industry

Energy production
- Power production
  - Stack gas analyzers
  - Engine
- Fuel Cell test systems

Transportation and storage
- Hydrogen storage, fuel cell vehicles, etc.
- Lithium-ion battery
- Raman spectrometers, etc.

Consumption and environment
- Electric vehicles, etc.
- Smart houses
- Gasoline, hybrid vehicles
- Offices and factories
- Air quality monitoring systems, etc.
- Four-wheel drive test systems, etc.
Thank you
Thank you

감사합니다

Cảm ơn

ありがとうございます

Grazie

Merci

谢谢你

Obrigado

Σας ευχαριστώ

谢谢

Tack ska ni ha

 شكرا

Данке

Большое спасибо

Gracias