FY2015 1st Half Results
(from April 1, 2015 to September 30, 2015)

November 2, 2015

This document contains forward-looking statements that are based on management’s expectations, estimates, projection and assumptions that were available and reasonable at the time of release. Actual future results and trends may differ materially from those in the forecasts due to a variety of factors.
Agenda

Summary of financial results for FY2015 1st Half
(Ended September 30, 2015)

Forecast for FY2015
(Ending March 31, 2016)

Segment Information

Capital Expenditure & Depreciation Cost

Ratio of new products to total sales / New products
(2017 Challenge 30)

R&D / Priority Tasks

Financial Condition
FY 2015 1st Half Consolidated Financial Results

<table>
<thead>
<tr>
<th></th>
<th>FY2014 1st half</th>
<th>FY2015 1st half</th>
<th>Growth ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(¥Bil.)</td>
<td>May announcement</td>
<td></td>
</tr>
<tr>
<td>Net Sales</td>
<td>168.0</td>
<td>210.0</td>
<td>+25%</td>
</tr>
<tr>
<td>Operating Income</td>
<td>28.8</td>
<td>35.0</td>
<td>+44%</td>
</tr>
<tr>
<td>Ordinary Income</td>
<td>26.9</td>
<td>34.0</td>
<td>+50%</td>
</tr>
<tr>
<td>Profit Attributable to Owners of Parent</td>
<td>20.1</td>
<td>24.0</td>
<td>+37%</td>
</tr>
</tbody>
</table>

Exchange Rate

<table>
<thead>
<tr>
<th></th>
<th>USD</th>
<th>EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sales</td>
<td>¥173.7 Bil (FY2007 1st half)</td>
<td>Net Income</td>
</tr>
<tr>
<td>Operating Income</td>
<td>¥34.9 Bil (FY2007 1st half)</td>
<td>Ordinary Income</td>
</tr>
</tbody>
</table>

Highest sales and income ever

- **Power**: A large overseas order of NAS® batteries was shipped.
- **Ceramics**: Demand for automotive-related products increased due to strong sales of passenger cars in the US and Europe, and trucks in the US.
- **Electronics**: Reflected the first half results of NGK Electronics Devices, Inc. acquired in January 2015. Demand for ceramic components for semiconductor manufacturing equipment grew.
- **In September**, we entered into a plea agreement with the U.S. Department of Justice. Because we have recorded provision for loss related to competition law in the last fiscal year, its effect on profit and loss is minimal.
# Forecasts for FY 2015

<table>
<thead>
<tr>
<th></th>
<th>FY2014 (¥Bil.)</th>
<th>May announcement</th>
<th>FY2015 (¥Bil.)</th>
<th>Growth ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net Sales</strong></td>
<td>378.7</td>
<td></td>
<td>420.0</td>
<td>+14%</td>
</tr>
<tr>
<td><strong>Operating Income</strong></td>
<td>61.6</td>
<td>68.0</td>
<td>72.0</td>
<td>+17%</td>
</tr>
<tr>
<td><strong>Ordinary Income</strong></td>
<td>61.1</td>
<td>69.0</td>
<td>74.5</td>
<td>+22%</td>
</tr>
<tr>
<td><strong>Profit Attributable to Owners of Parent</strong></td>
<td>41.5</td>
<td>48.0</td>
<td>51.0</td>
<td>+23%</td>
</tr>
</tbody>
</table>

**Exchange Rate**

<table>
<thead>
<tr>
<th>Currency</th>
<th>FY2014 Rate</th>
<th>FY2015 Rate</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD</td>
<td>¥110</td>
<td>¥119</td>
<td>+¥9</td>
</tr>
<tr>
<td>EUR</td>
<td>¥139</td>
<td>¥132</td>
<td>−¥7</td>
</tr>
</tbody>
</table>

*Highest sales and income forecasts ever*

- **Power**: NAS® batteries shipment for Kyushu Electric Power is expected. Significantly higher sales forecast; sequent expected to go into the black.
- **Ceramics**: While sales in China may have weakened, sales of passenger cars in Europe and the US, and sales of trucks in the US are expected to remain strong.
- **Electronics**: Due to the delayed investments in mobile phone base stations mainly in China, demand for the package products will fall below the initial forecast.

*Net Sales ￥378.7 Bil (FY2014)
Operating Income ￥69.4 Bil (FY2007)
Ordinary Income ￥69.3 Bil (FY2007)
Net Income ￥46.0 Bil (FY2007)
Change Analysis: Sales

FY 2015 1st half Presentation

FX Rate
3/15
¥110/USD
¥139/EUR

May (3/16 Est.)
¥115/USD
¥125/EUR

New (3/16 Est.)
¥119/USD
¥132/EUR
Change Analysis: Operating Income

FY 2015 1st half Presentation

3/15

3/16 Est.

FX Rate

3/15

¥110/USD
¥139/EUR

May(3/16 Est.)

¥115/USD
¥125/EUR

New(3/16 Est.)

¥119/USD
¥132/EUR

72.0

May

Automotive related

Electronics

Power

FX

68.0

+0.8

+2.7

+2.5

+3.1

-3.0

+1.4

3/15

61.6

+2.7

+2.7

+0.2

New

Others

Power
Insulators
- Demand remains strong both domestically and overseas (mainly in North America, Middle East, and Southeast Asia) and profit is expected.
  - Aim to improve earnings by capturing replacement demand for insulators installed after the high-speed growth period, and making further cost reductions.

NAS
- With some overseas large-scale orders, and orders received and shipments for Buzen Power Station of Kyushu Electric Power, significantly higher sales and profit are projected.
- Demand for long time use, the key features of NAS batteries, is currently limited. We expect full-scale demand to arise around 2020. Aim to secure continuous demand by capturing new demand overseas and strengthening partnerships with customers.
Boost domestic replacement demand for insulators

- In Japan, replacement demand for insulators installed after the high-speed growth period is increasing.
- As future replacement demand will exceed the construction capacity of customers, boost demand by proposing replacement standards, and other means.

Shipment of large-capacity NAS batteries for power grids planned for FY2015

- We received an order from Mitsubishi Electric Corporation to install the world’s largest NAS battery system, to be used for electricity storage, at the Buzen Power Station of Kyushu Electric Power Co., Inc. (Power output: 50,000kW / Storage capacity: Approx. 300,000kWh)
- New containerized batteries, which substantially reduce the installation lead time compared to the former models, were successfully developed.
- Drawing on this achievement, we encourage the use of NAS batteries as a stabilization measure for a renewable energy power grid.
● Electronics Components
  • Due to delayed investments in mobile phone base stations mainly in China, demand for package products is temporarily stagnant.

● Ceramics for Semiconductor Manufacturing Equipment (SPE-related products)
  • Demand increases as semiconductor companies are continuing high-level investments for further multi-layering and miniaturization on the back of increased demand for semiconductors for data centers.
  • Focus on cost reduction by working on technological advancement of products and establishing the use of innovative production methods.

● Metal Related Products
  • Demand in China may weaken. Grow the business by developing new materials and products with new uses.

(¥ Bil.) <After consolidation elimination>

【Sales】

(¥ Bil.)

【Operating Income】

Operating Income Margin

- Electronics Business

- Electronics Components
- Ceramics for Semiconductor Manufacturing Equipment (SPE-related products)
- Metal Related Products

- Due to delayed investments in mobile phone base stations mainly in China, demand for package products is temporarily stagnant.

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- Focus on cost reduction by working on technological advancement of products and establishing the use of innovative production methods.

- Demand in China may weaken. Grow the business by developing new materials and products with new uses.
Growth Strategies for the Electronics Business

■ Ceramic Components for Semiconductor Manufacturing Equipment

Semiconductor manufacturing equipment demand remains at high level on the back of increased demand for semiconductors for data centers

![Graph showing shipment of semiconductor products and amount of manufacturing equipment investment](image)

- Semiconductor: WSTS
- Manufacturing equipment: Gartner WFE

Make capital investments in advance in view of anticipated rise in demand

■ Ceramic Package Business (Electronics Components)

Ceramic package market is projected to expand in the medium to long term

![Graph showing market size of ceramic packages (NGK’s Est.)](image)

- Quartz crystal package

■ Wafer Products (Electronics Components)

Widespread adoption of LTE and next-generation LTE expands SAW filter market

- Translucent alumina wafer (HICERAM™ wafer)
- Gallium nitride (GaN) wafer

[Example of final products]
- Ultra-bright LED
- High-power blue/green laser
- Next-generation power semiconductor

Demand for our wafers will increase

![Graph showing sales forecast for wafer products](image)

- Bonded wafers for SAW filters
- For temperature compensated SAW filters

Alternative use of alumina and sapphire substrates with high resistivity & conductivity, and larger diameters
Automotive-related
• Demand for SiC-DPF increases due to strong sales of passenger cars in Europe.
• Sales of trucks in the US remain strong, whereas sales are stagnant in China.
• The effect of the European auto manufacturer’s misconduct in exhaust gas treatment is uncertain at this moment in time. For the mid to long term, the global trend for tighter emission regulations is set to continue and the demand for related products will increase. We will continue to focus on constructing a global production system.

Industrial processes
• Capex in Japan shows signs of recovery with improvement of medical, electronic, and chemical industries.
• Continue efforts to improve profitability.

**Ceramics Business**

<table>
<thead>
<tr>
<th>Sales</th>
<th>Operating Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>191</td>
<td>23.6%</td>
</tr>
<tr>
<td>191</td>
<td>25.4%</td>
</tr>
<tr>
<td>191</td>
<td>24.3%</td>
</tr>
<tr>
<td>191</td>
<td>25.5%</td>
</tr>
<tr>
<td>191</td>
<td>45.0</td>
</tr>
<tr>
<td>191</td>
<td>57.6</td>
</tr>
<tr>
<td>191</td>
<td>58.0</td>
</tr>
<tr>
<td>191</td>
<td>62.0</td>
</tr>
</tbody>
</table>

*FY 2015 1st half presentation*
The effect of the European auto manufacturer’s misconduct in exhaust gas treatment is uncertain at this moment in time.
Establish a new manufacturing base in Thailand in response to mid- to long-term demand increase in Asian developing countries. Including in Poland (1st and 2nd plants) and at the Ishikawa Plant (NOx sensor), increase productivity worldwide.
Capital Expenditure & Depreciation Cost

Total of ¥150bil capital expenditure in 3 years, mainly in Automotive-related

1.1 1.6 3.0
24.1
2.3
20.1 19.9
25.5
2.0
2.7 3.0 2.7 4.0
20.4 20.9
36.0 3.9 5.2
14.0
28.0
31.2
28.4
30.4
57.0(Planned)

Production starts in January, 2016
Production starts in January, 2017
Production starts in April, 2017
Honeycomb production starts in April, 2018
Range of products manufactured will expand in line with phased investments by 2020

1st plant in Poland: ¥12.0 Bil. (LSH, Cd-DPF, GPF)
2nd plant in Poland: ¥17.0 Bil. (SiC-DPF)
Ishikawa Plant: ¥8.3 Bil. (NOx sensor)
New manufacturing base in Thailand: ¥50.0 Bil. (Honeycomb, etc.)
Raise the ratio of new products to total sales to 30% by FY2017.
Quick commercialization of new products

**Ceramic fuel cell module**

SOFC (Solid-Oxide Fuel Cell) module

- Compact but highly efficient and durable power generation component made of ceramic enabled by proprietary configuration and ceramic material

This component generates electricity in a chemical reaction using gas as a fuel. The heat generated is used to heat water, which greatly contributes to energy conservation. It is expected to be used in detached houses, and commercial buildings.

**Zinc secondary battery**

- Safe storage battery for small- to medium-sized functions with large capacity using proprietary OH ion-conducting ceramic materials in its separators

As it has large capacity, operability at normal temperatures, and is very safe thanks to the use of aqueous electrolyte, it can be installed in various locations. It is suitable for houses, buildings, hospitals and commercial buildings.

**All-solid-state battery**

- All-solid-state battery which are ultra-slim, high energy dense and operable under high temperatures

The battery enables adjacent mounting with semiconductor components, sensors, wireless ICs and antennas on the circuit board, and contributes to the reduction in size and width of electronic devices.

**Fuel cell system for a detached house and an apartment building (installed in every unit)**

Household-type storage battery (10kWh class)

- Being evaluated at major fuel cell system companies for commercialization

Indoor-type storage battery (500kWh class)

- Being evaluated for long-term durability, for commercialization in 2017

**Wearable devices**

- Samples being evaluated at more than 10 companies

- Compact but highly efficient and durable power generation component made of ceramic enabled by proprietary configuration and ceramic material

The battery enables adjacent mounting with semiconductor components, sensors, wireless ICs and antennas on the circuit board, and contributes to the reduction in size and width of electronic devices.

- All-solid-state battery which are ultra-slim, high energy dense and operable under high temperatures

- All-solid-state battery which are ultra-slim, high energy dense and operable under high temperatures
R&D Input

3/12  11.4
3/13  11.3
3/14  12.1
3/15  13.9
3/16 Est. 17.5

Corporate 4.0
Electronics 5.0
Power 2.5
Ceramics 6.0

R&D/Sales Ratio

4.6%  4.5%  3.9%  3.7%  4.1%
Priority Tasks

- Respond to demand expansion
  Enhance the competitiveness of the product

- Break dependence on Automotive-related products

- Strengthen system to respond
  Global expansion
  Risk countermeasure

- Strengthen global productivity
  - Planning world wide production increase, mainly automotive-related products
  - Coinstantaneous world wide plant establishment

- Enhance the competitiveness of existing products
  New Structural Innovation of Manufacturing
  - Increase the value of the products by advanced technology
  - Reduce cost by establishing innovational manufacturing process.

- Create new product and business
  2017 Challenge 30
  - Raise the ratio of new products to total sales to 30%
  - Early commercialization of promising business
  - Set up the new department to reinforce the marketing and experimental production

- Enlarge the global management
  Upgrade the cooperate headquarter
  - Rapid response to the change of business conditions, and legal requests

Further Enhancement of Governance framework
Commit Stronger Regulatory Compliance
Renovate Corporate Culture

Become a world-class global company
## Summary of Cash Flow

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Activities</strong></td>
<td>32.6</td>
<td>73.0</td>
<td>58.0</td>
</tr>
<tr>
<td><strong>Investing Activities</strong></td>
<td>-21.2</td>
<td>-39.5</td>
<td>-60.0</td>
</tr>
<tr>
<td><strong>Financing Activities</strong></td>
<td>2.0</td>
<td>-26.0</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>Effect of exchange rate change</strong></td>
<td>3.4</td>
<td>1.3</td>
<td>-1.0</td>
</tr>
<tr>
<td><strong>Net Change in Cash &amp; Eq-</strong></td>
<td>16.9</td>
<td>8.8</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Cash &amp; Eq- at the End of Year</strong></td>
<td>119.8</td>
<td>128.6</td>
<td>130.6</td>
</tr>
</tbody>
</table>
## Sales by Product (Annual)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulators</td>
<td>57.6</td>
<td>53.9</td>
<td>57.0</td>
<td>60.0</td>
</tr>
<tr>
<td>NAS</td>
<td>0.1</td>
<td>5.1</td>
<td>15.8</td>
<td>25.0</td>
</tr>
<tr>
<td>Power Business</td>
<td>57.7</td>
<td>59.0</td>
<td>72.8</td>
<td>85.0</td>
</tr>
<tr>
<td>Honeycomb filters</td>
<td>50.6</td>
<td>65.1</td>
<td>72.4</td>
<td>77.0</td>
</tr>
<tr>
<td>SiC-DFP</td>
<td>26.5</td>
<td>37.6</td>
<td>41.8</td>
<td>41.0</td>
</tr>
<tr>
<td>Cd-DFP / LSH</td>
<td>33.0</td>
<td>51.8</td>
<td>68.9</td>
<td>71.0</td>
</tr>
<tr>
<td>Sensors</td>
<td>10.1</td>
<td>16.4</td>
<td>24.0</td>
<td>33.0</td>
</tr>
<tr>
<td>Industrial Process</td>
<td>23.7</td>
<td>19.9</td>
<td>20.0</td>
<td>21.0</td>
</tr>
<tr>
<td>Ceramics Business</td>
<td>144.0</td>
<td>190.8</td>
<td>227.1</td>
<td>243.0</td>
</tr>
<tr>
<td>Metal related</td>
<td>17.2</td>
<td>18.6</td>
<td>21.5</td>
<td>20.5</td>
</tr>
<tr>
<td>SPE related</td>
<td>15.6</td>
<td>24.3</td>
<td>31.5</td>
<td>37.0</td>
</tr>
<tr>
<td>Electric Related</td>
<td>7.7</td>
<td>4.8</td>
<td>14.5</td>
<td>33.4</td>
</tr>
<tr>
<td>Soshin Electric CO.</td>
<td>10.5</td>
<td>11.2</td>
<td>11.3</td>
<td>11.1</td>
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<tr>
<td>Electronics Business</td>
<td>51.1</td>
<td>58.9</td>
<td>78.8</td>
<td>102.0</td>
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<tr>
<td>Total</td>
<td>252.8</td>
<td>308.7</td>
<td>378.7</td>
<td>430.0</td>
</tr>
</tbody>
</table>

*Note: After Consolidation Elimination*
### Sales by Product (Semi Annual)

<After Consolidation Elimination>

<table>
<thead>
<tr>
<th></th>
<th>3/15 1&lt;sup&gt;st&lt;/sup&gt; Half</th>
<th>3/15 2&lt;sup&gt;nd&lt;/sup&gt; Half</th>
<th>3/16 Est. 1&lt;sup&gt;st&lt;/sup&gt; Half</th>
<th>3/16 Est. 2&lt;sup&gt;nd&lt;/sup&gt; Half</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insulators</strong></td>
<td>26.7</td>
<td>30.3</td>
<td>27.9</td>
<td>32.1</td>
</tr>
<tr>
<td><strong>NAS</strong></td>
<td>1.5</td>
<td>14.3</td>
<td>5.9</td>
<td>19.1</td>
</tr>
<tr>
<td><strong>Power Business</strong></td>
<td>28.2</td>
<td>44.6</td>
<td>33.8</td>
<td>51.2</td>
</tr>
<tr>
<td><strong>Honeycomb filters</strong></td>
<td>35.1</td>
<td>37.3</td>
<td>39.1</td>
<td>37.9</td>
</tr>
<tr>
<td><strong>SiC-DPF</strong></td>
<td>20.4</td>
<td>21.4</td>
<td>22.1</td>
<td>18.9</td>
</tr>
<tr>
<td><strong>Cd-DPF / LSH</strong></td>
<td>32.0</td>
<td>36.9</td>
<td>37.0</td>
<td>34.0</td>
</tr>
<tr>
<td><strong>Sensors</strong></td>
<td>11.4</td>
<td>12.6</td>
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<td><strong>Industrial Process</strong></td>
<td>7.7</td>
<td>12.3</td>
<td>9.6</td>
<td>11.4</td>
</tr>
<tr>
<td><strong>Ceramics Business</strong></td>
<td>106.6</td>
<td>120.5</td>
<td>122.7</td>
<td>120.3</td>
</tr>
<tr>
<td><strong>Metal related</strong></td>
<td>10.7</td>
<td>10.8</td>
<td>10.6</td>
<td>9.9</td>
</tr>
<tr>
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<td>14.4</td>
<td>17.1</td>
<td>18.7</td>
<td>18.3</td>
</tr>
<tr>
<td><strong>Electric Related</strong></td>
<td>2.4</td>
<td>12.1</td>
<td>19.5</td>
<td>13.9</td>
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<tr>
<td><strong>Soshin Electric CO.</strong></td>
<td>5.8</td>
<td>5.5</td>
<td>5.4</td>
<td>5.7</td>
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<tr>
<td><strong>Electronics Business</strong></td>
<td>33.3</td>
<td>45.5</td>
<td>54.1</td>
<td>47.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>168.0</td>
<td>210.7</td>
<td>210.6</td>
<td>219.4</td>
</tr>
</tbody>
</table>
The purpose of this brief is information disclosure for better understanding of NGK Group’s policies, projections and financial condition. This brief does not solicit buying and selling of NGK’s shares. The figures included in this brief, including the business performance targets and figures, are all projected data based on the information currently available to the NGK Group, and are subject to variable factors such as economic conditions, competitive environments and future demands. Accordingly, please be advised that the actual results of business performance may differ substantially from the projections described here.