Four Companies in the Morimura Group (NORITAKE, TOTO, NGK INSULATORS, NGK SPARK PLUG) Concluded a Memorandum of Understanding regarding the Establishment of Joint Venture for Solid Oxide Fuel Cell

March 4th 2019

NORITAKE CO., LIMITED
TOTO LTD.
NGK INSULATORS, LTD.
NGK SPARK PLUG CO., LTD.
## Presenters

<table>
<thead>
<tr>
<th>Company</th>
<th>Title</th>
<th>Name</th>
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<tr>
<td>NORITAKE CO., LIMITED</td>
<td>President &amp; Representative Director</td>
<td>Hiroshi Kato</td>
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<td>TOTO LTD.</td>
<td>President, Representative Director</td>
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<td>President</td>
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<td>Representative Director and Chairman of the board Chief Executive Office</td>
<td>Shinichi Odo</td>
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Background of Establishing the JV – Potential of SOFC
Solid Oxide Fuel Cell (SOFC) is a type of fuel cell, uses ceramic in the core part called “cell stack”, that generates electricity and heat using oxygen in the air and hydrogen reformed from gas. It is expected to actualize environmental-friendly and efficient electrical generating system even at small scale.

Potential of SOFC

**Home-Use**
- Portable power supply
- ENE-FARM (Fuel cell for residential use)

**Business-Use**
- ENE-FARM for apartments
- Building

**Industrial Use**
- Onsite power plant (size: MW)
- Major power plant (size: 100MW)
- Office with heat supply system
Background of Establishing the JV – spreading fuel cell e.g. ENE-FARM

In the field of fuel cells, for example, it is expected that domestic fuel cells (ENE-FARM) will continue to be spread.

The cumulative number of ENE FARM

Reference:
- Calculation by Fuel Cell Association (Calculation is based on the number of subsidy to be distributed for ENE FARM)
Background of Establishing the JV – Advantage of SOFC

Further diffusion of domestic fuel cells will accelerate by SOFC commercialization.

- CO₂ Free
- Governmental Leadership (Subsidy)
- Free from Scale and location (Distributed, Portable, Small Scale)
- Efficient Power Generation

Advantage of SOFC
Background of Establishing the JV--integrating some of the SOFC technology of the 4 companies

The establishment of the JV by four companies accelerates the commercialization and practical application of SOFC by integrating some of the SOFC technology that each company has developed and will contribute to spread environmental-friendly and efficient power generating fuel cell.

The JV accelerates the commercialization and practical application for SOFC by integrating some of the SOFC technology that each company has developed.
Overview of the JV - Purposes
Purpose: Acceleration of SOFC commercialization
1. Four companies in the Morimura group invest and establish the JV
2. Each company provides necessary resources for synergy and enhancing efficiency of the business

Business: Research, development, manufacturing, and sales of SOFC

Contribute to solve energy and environmental issues by early commercialization and to spread SOFC by integrating necessary resources from four companies

The JV’s commencement of operation (Planned): December 1\textsuperscript{st}, 2019