

**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

Company	Title	Name
NORITAKE CO., LIMITED	President & Representative Director	Hiroshi Kato
TOTO LTD.	President, Representative Director	Madoka Kitamura
NGK INSULATORS, LTD.	President	Taku Oshima
NGK SPARK PLUG CO., LTD.	Representative Director and Chairman of the board Chief Executive Office	Shinichi Odo

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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

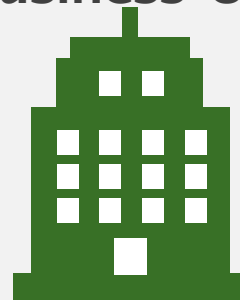


Portable power supply



ENE-FARM
(Fuel cell for residential use)

Business-Use

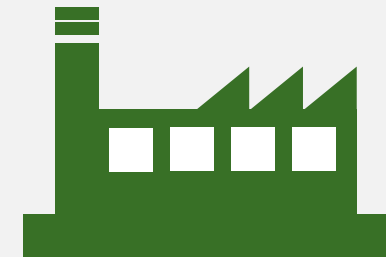


ENE-FARM for apartments



Building

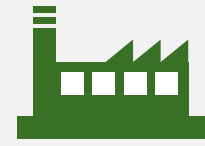
Industrial Use



Onsite power plant
(size: MW)



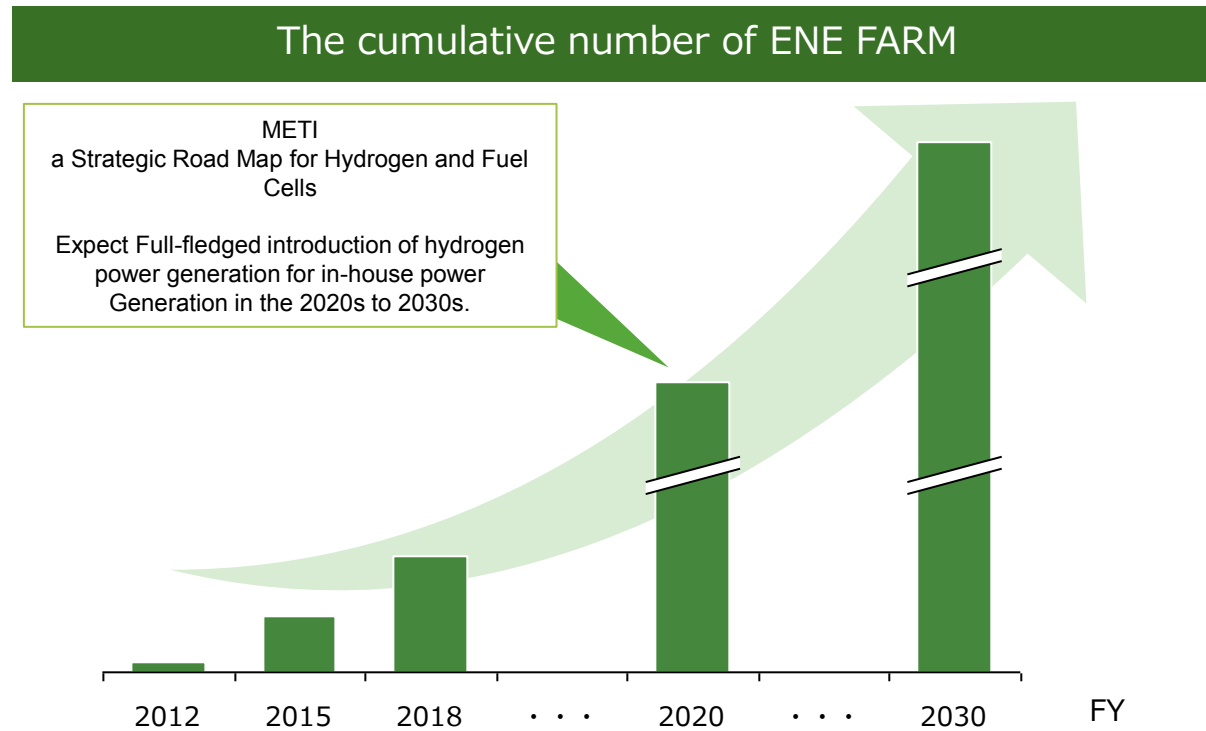
Major power plant
(size: 100MW)



Office with heat supply system

Background of Establishing the JV – spreading fuel cell e.g. ENE-FARM

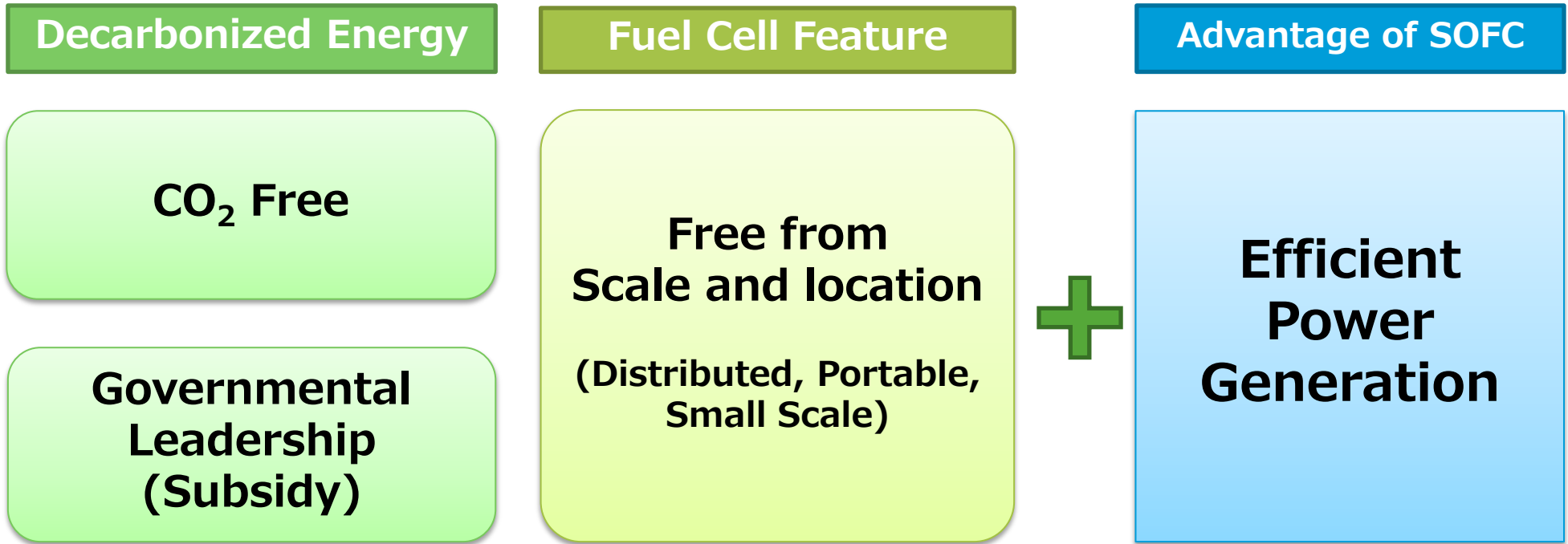
In the field of fuel cells, for example, it is expected that domestic fuel cells (ENE-FARM) will continue to be spread.



Reference:
- Calculation by Fuel Cell Association (Calculation is based on the number of subsidy to be distributed for ENE FARM)

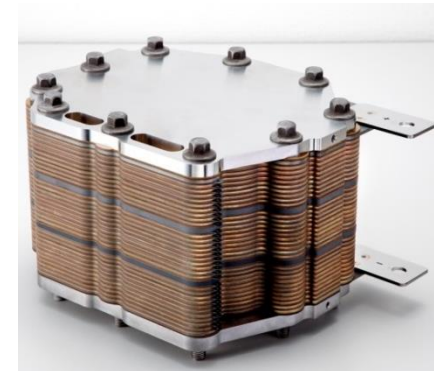
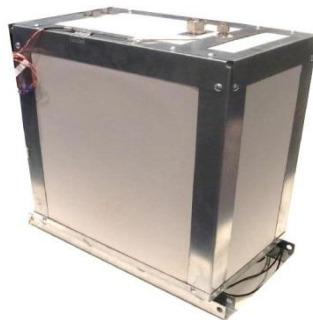
Background of Establishing the JV – Advantage of SOFC

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



Background of Establishing the JV- integrating the 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

