

TOSHIBA

Renewable energy Hydrogen and its application for Indonesia

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Indonesian energy situations

1. Acceleration of RE(renewable energy) shift

RUPTL 2018 shifted to GAS and RE instead of coal combustion

2. Large population in islands

Approximately 50Mill people live in islands and remote areas.
Distributed energy systems are necessary for them.

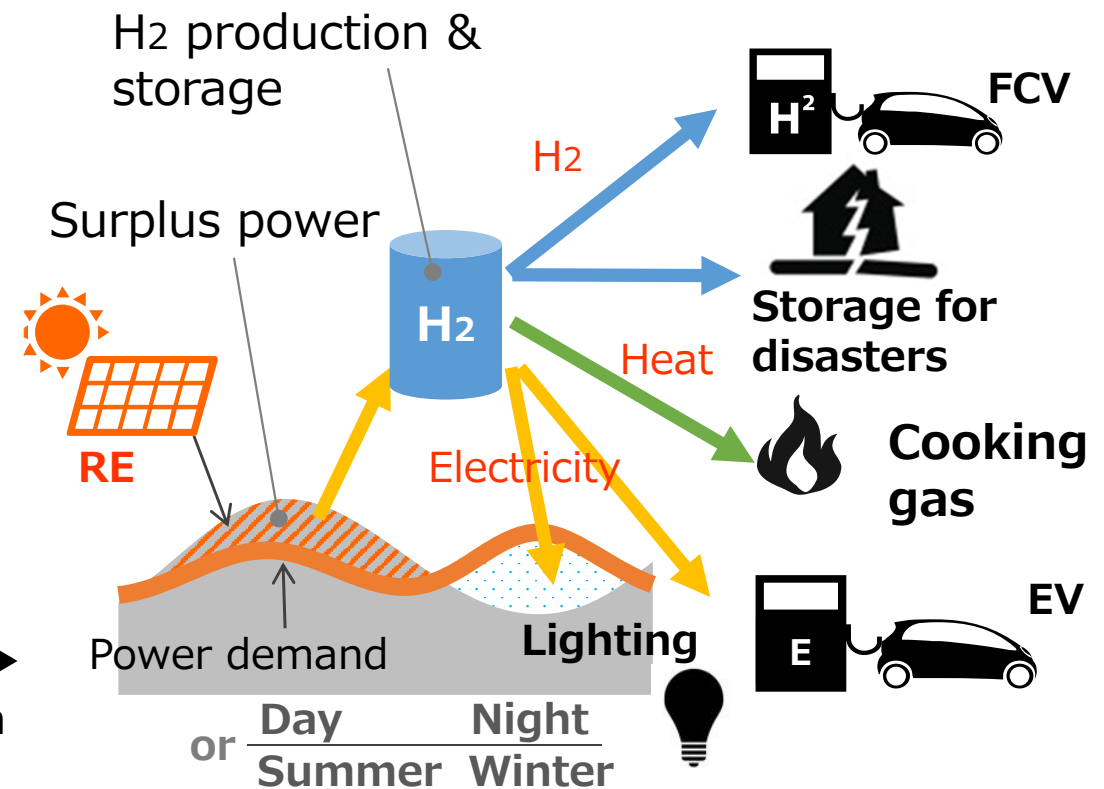
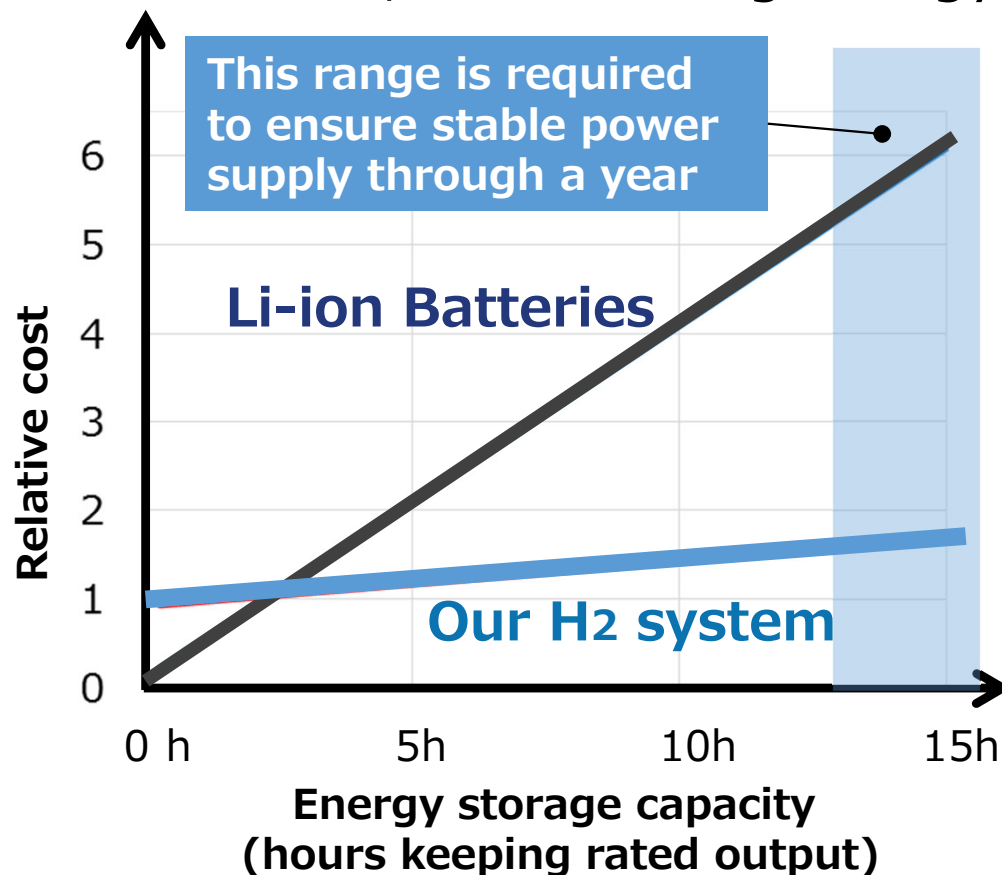
3. Promotion for economical electrification

Electrification has chiefly been supported by subsidies.

The Hydrogen energy supply system

The H₂ system would be one of the answer for the Indonesian situations

- Energy storage technology enough to supply stable power all year around by RE only regardless of weather
- Apart from electricity, enables the other useful energy supply
- In disasters, enables long energy supply using stored H₂



H2One™ The Hydrogen energy supply system

Distributed energy supply system using H2 power storage tech.



HUIS TEN BOSCH, Henn-na Hotel in Nagasaki pref. Japan



CAPEX 2/5 against Li-ion battery system

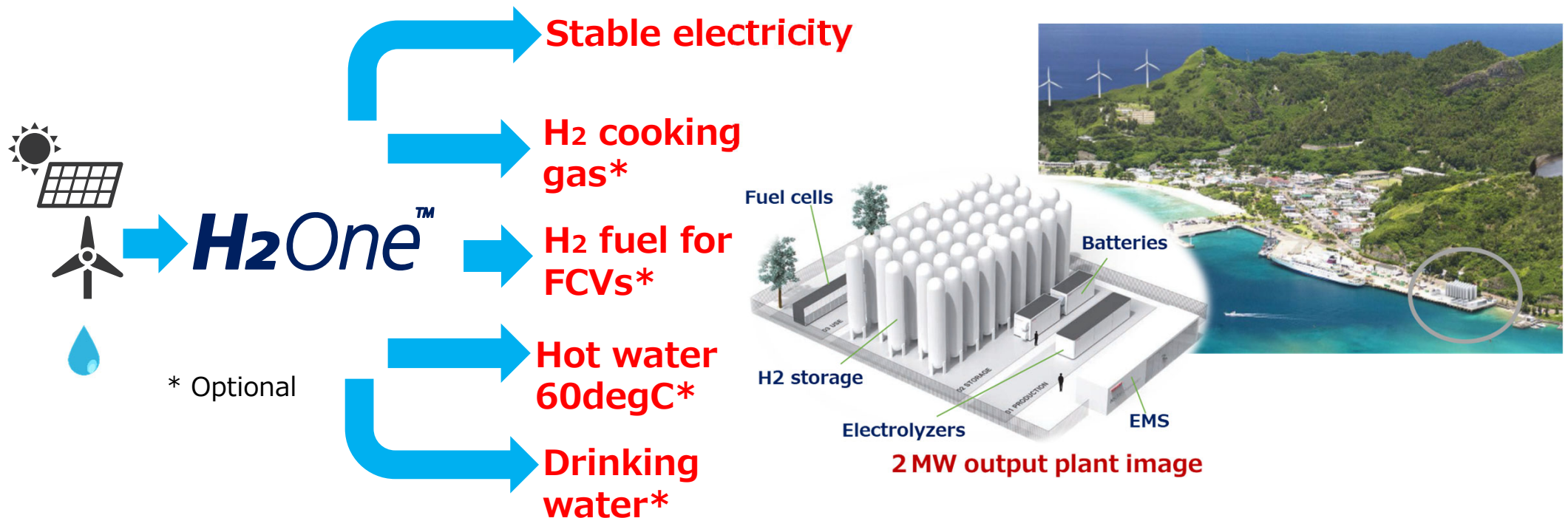
This system has supplied stable power and hot water for 12 rooms of the hotel all year around using the rooftop PV in disconnected to power grid from Mar. 2016*

Items	Spec.
PV	60kW
H2 production	Max. 2m3/h
H2 storage	Max. 900Nm3 (1.4MWeh)
Output power	Max. 55kW
Occupied space	30m2

*Demonstration project subsidized by METI (Ministry of Economy, Trade and Industry)

Large *H2One*TM for off-grid and remote areas

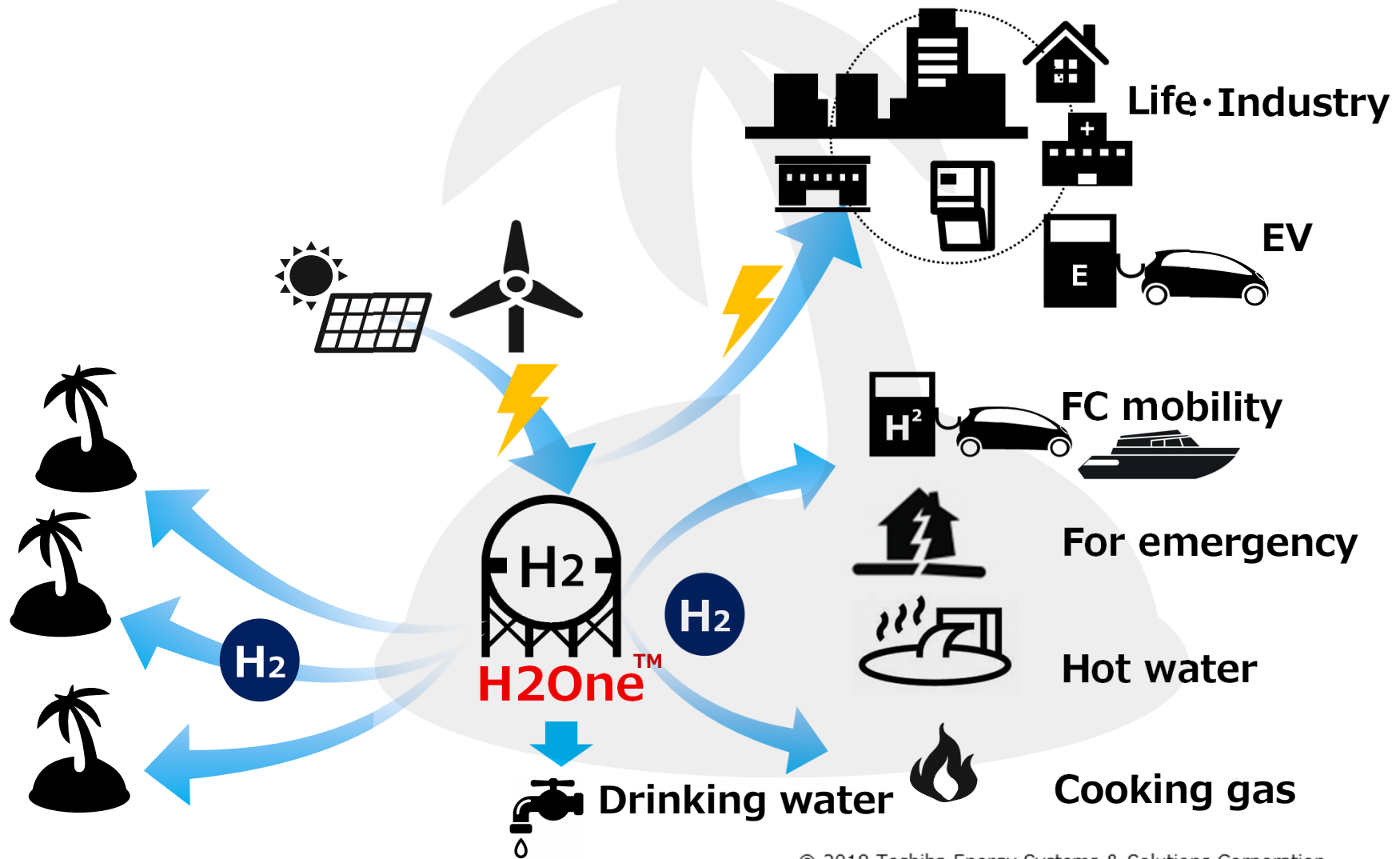
- 100kW to MW scale energy supply suited to islands and remote areas
- Competitive total cost against DG in remote areas
- Not only electricity, multi-purposes energy supply
- Deploy for remote areas from 2020



Good resilience, hygiene, environment and comfortable life

H₂ future society in Indonesia

- Unlike so far, RE will be distributed as different types of energy via H₂ of an “ENERGY HUB”
- Independent energy and virtuous cycle in the economy will arise in local communities utilizing their owned RE resources



Collaboration with BPPT utilizing JPN subsidized F/S

- Investigation for the applicability of distributed H₂ energy system towards Indonesian remote islands and areas
 - Shall be concluded in the end of Feb. 2019
 - Installation plan based on economical study including comparison with the other power storage technologies
 - Specification suitable for Indonesian circumstances
 - Supply chains including collaborative business with Indonesian companies in procurement, manufacturing and O&M
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We promote H2One™ deployment in collaboration along with Indonesian companies and government



A promising approach leading to further penetration of CO₂-free energy

Terima kasih



BPPT & Toshiba, MoU signing in Aug. 2018

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