Hydrogen Society

The Japanese Approach

Johanna Schilling

jschilling@ecos.eu

Why H2 Society?

"Japan will be the first in the world to realize a hydrogen-based society"

Prime Minister Abe, 27th February 2017

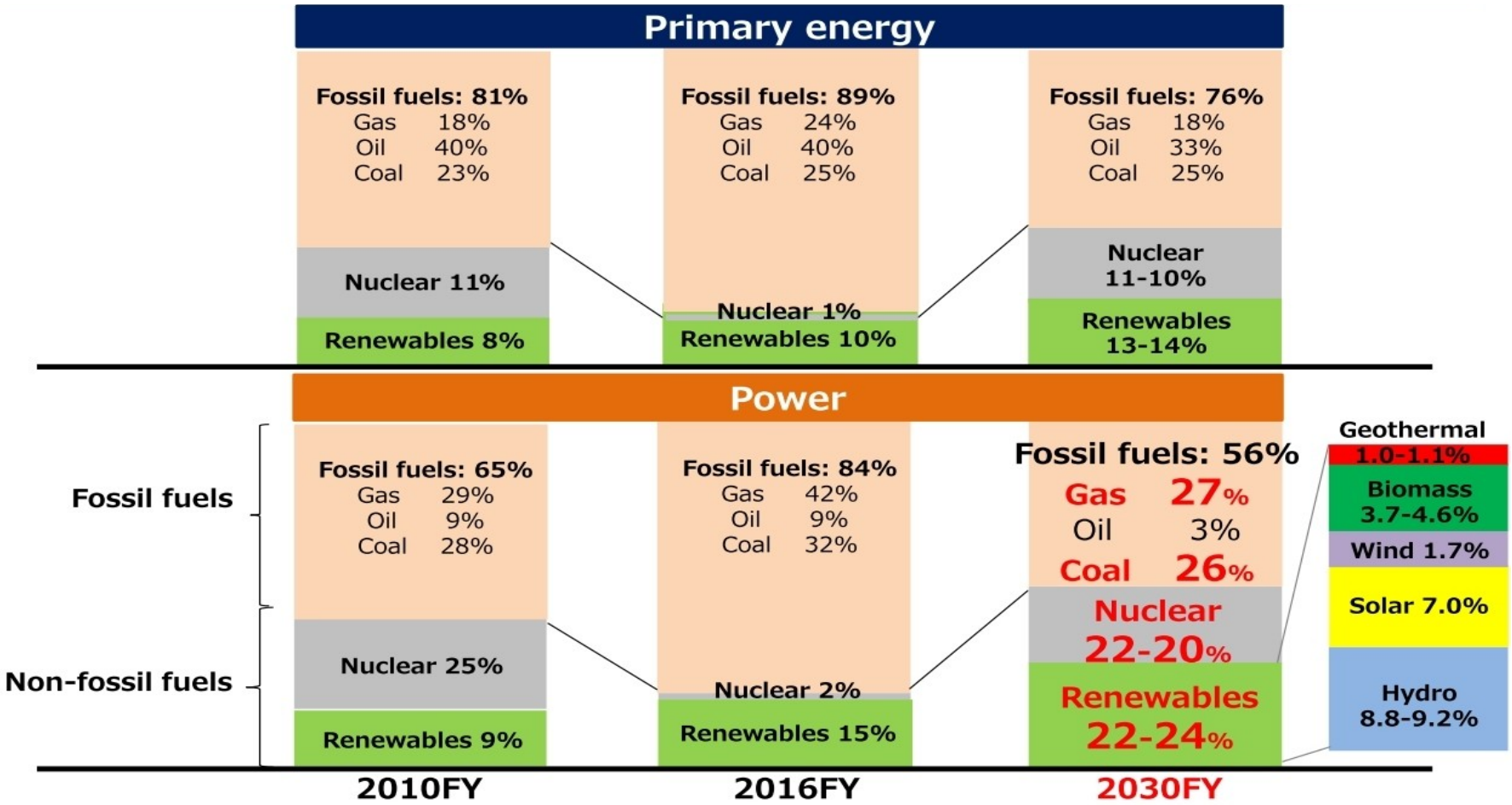
Source: NEDO

Agenda

1. Why H2 Society?
2. METI's Basic Hydrogen Strategy & Roadmap
3. PtG Project Examples
4. Ongoing German-Japanese Collaborations

Why H2 Society?

Energy Mix before and after Fukushima



Source: METI

Why H2 Society?

Energy Policy

<Policy target for 3E+S>

Safety (top priority)

Energy security

Self-sufficiency: About 25%, higher than before the great east Japan earthquake (about 20%)

Economic efficiency

Electricity cost: To lower from the current level (9.7 trillion yen in FY2013 to 9.5 trillion yen in FY2030)

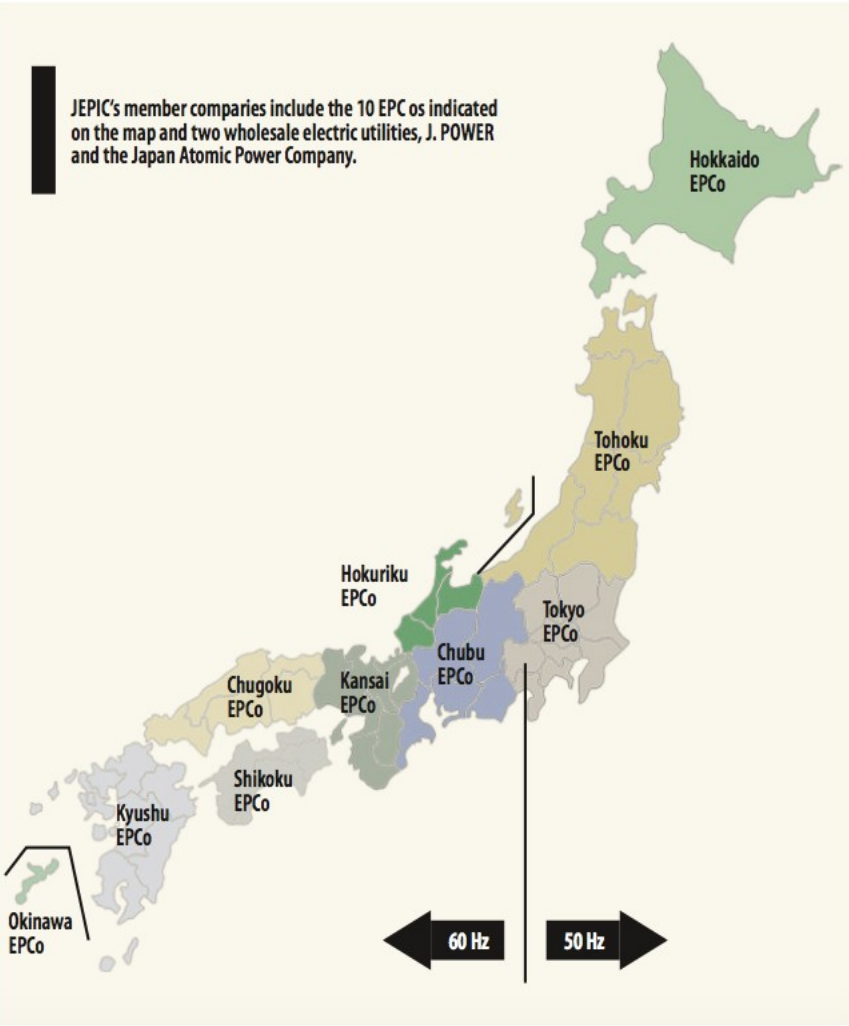
Environment

Greenhouse gas emission reduction target: (reduction of 26.0% in FY 2030 compared to FY 2013)

Source: METI

Why H2 Society?

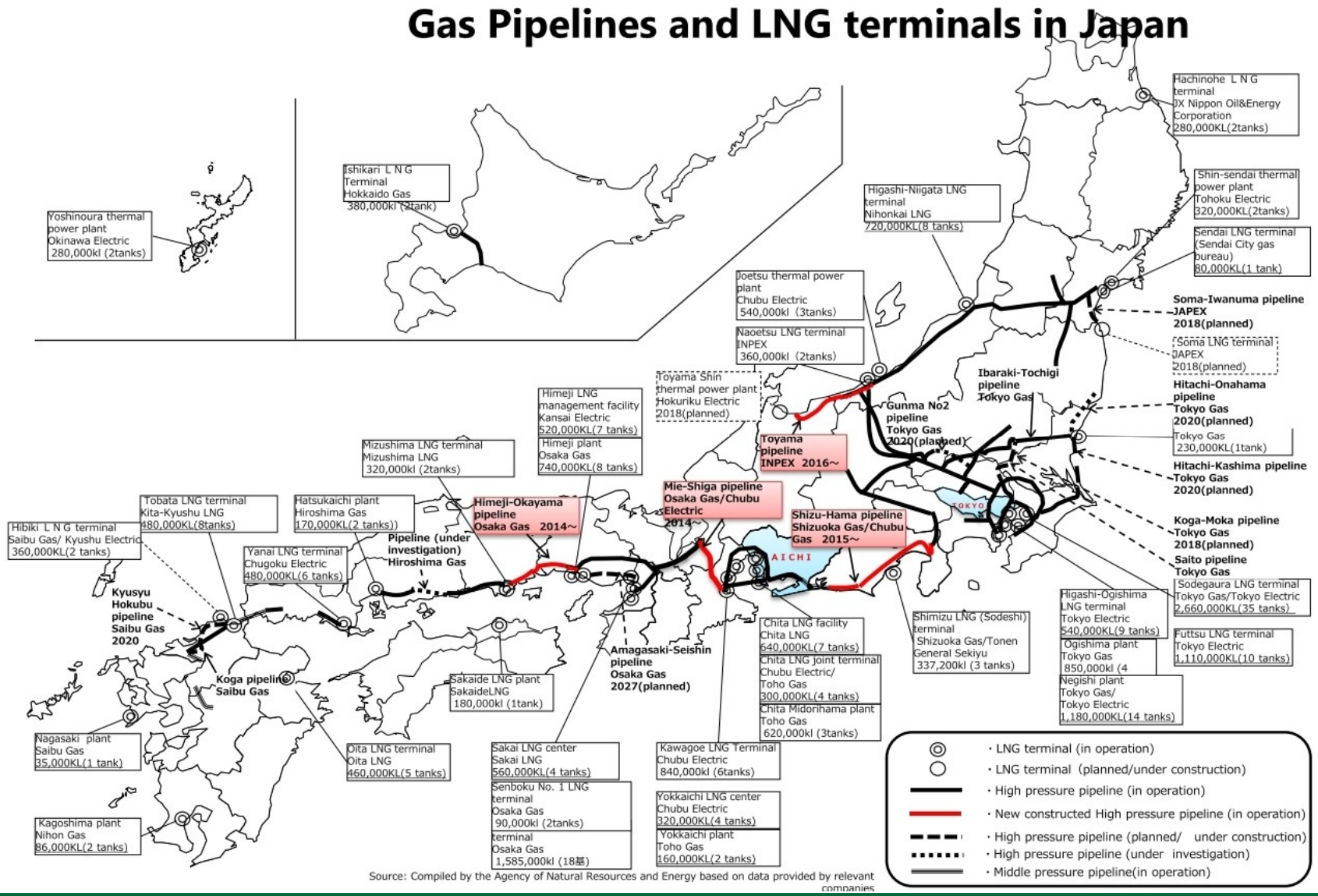
Constraints of the Electricity Grid



- ten utility companies
- two different current voltages

Source: IZES/JEPIC 2017

Problem: Gas Grid is limited



Source: METI

Agenda

1. Why H2 Society?
2. METI's Basic Hydrogen Strategy & Roadmap
3. PtG Project Examples
4. Ongoing German-Japanese Collaborations

METI's Basic Hydrogen Strategy

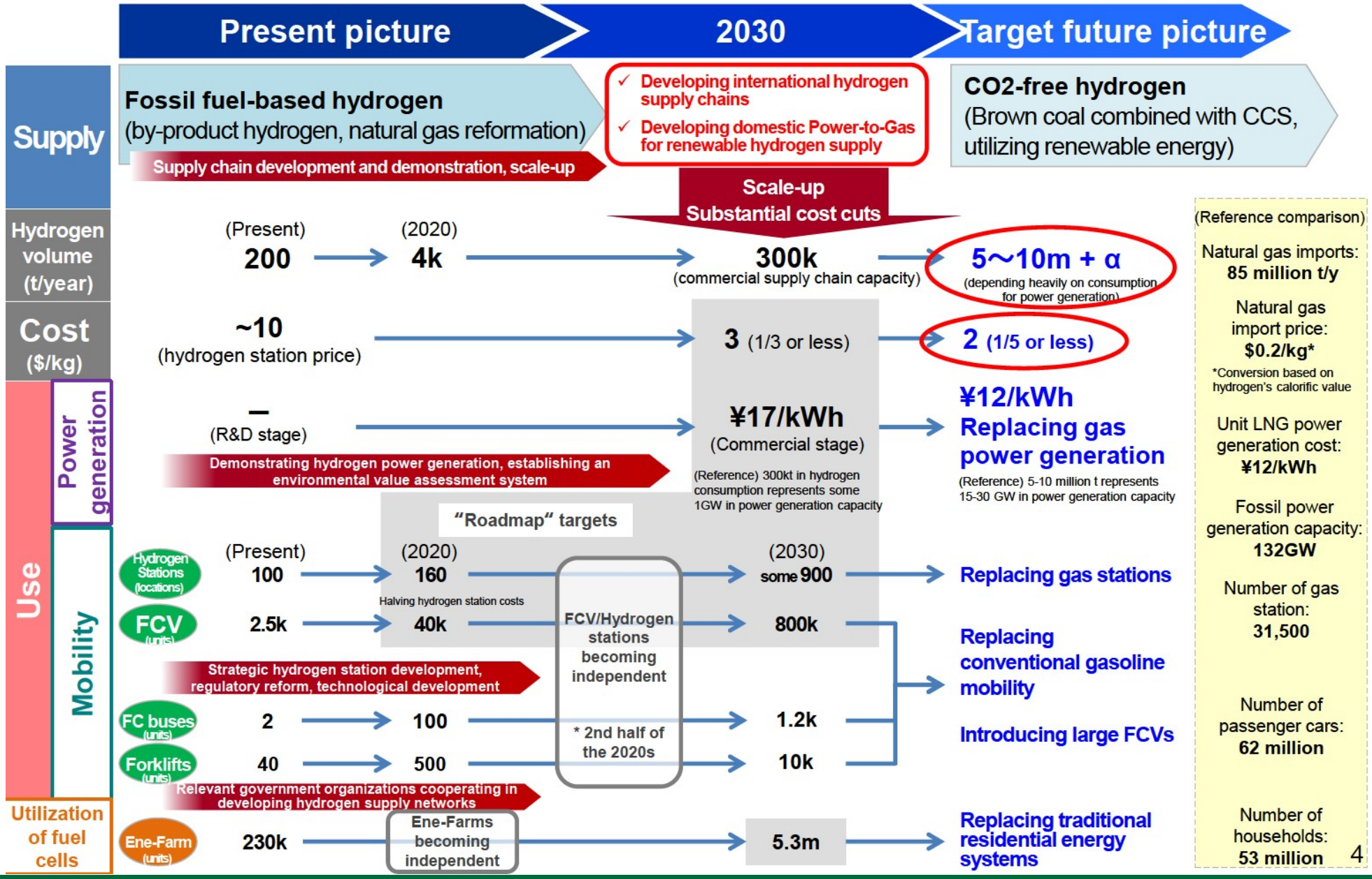
"Basic Hydrogen Strategy"

- Announced on December 26, 2017 by the Ministerial Council on Renewable Energy, Hydrogen and Related Issues
- World's first national H_2 strategy
- 2050 Vision: position H_2 as a new energy option
- Target: make H_2 competitive

Source: NEDO

Scenario for Basic Hydrogen Strategy

METI Ministry of Economy, Trade and Industry



Fuel Cell Applications

Residential Fuel Cells

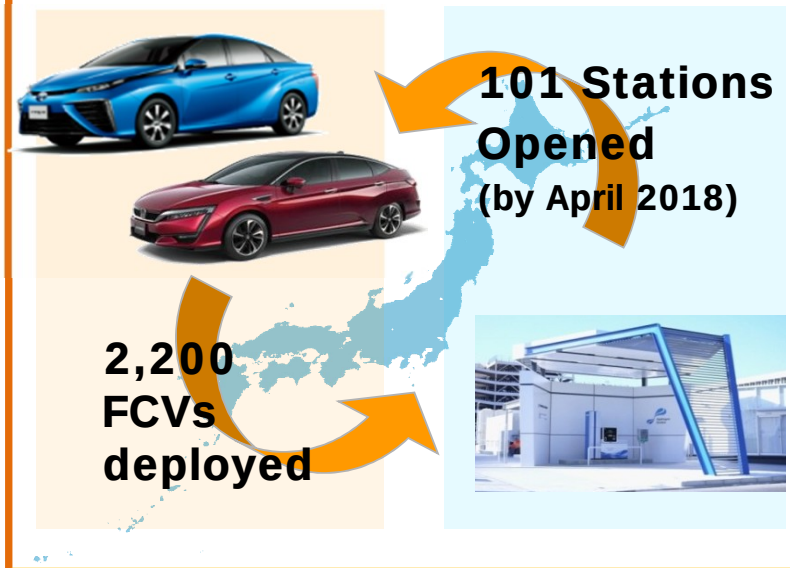
Marketed in 2009･･･

Around 250,000 units

Targets

- 1.4 million units by FY2020
- PEFC : 800,000 yen (approx. $7,000) by FY2019
- SOFC : 1,000,000 yen (approx. $8,800)by FY2021

FCV & HRS



Targets

FCV

- 40,000 by FY2020
- 200,000 by FY2025
- 800,000 by FY2030

HRS

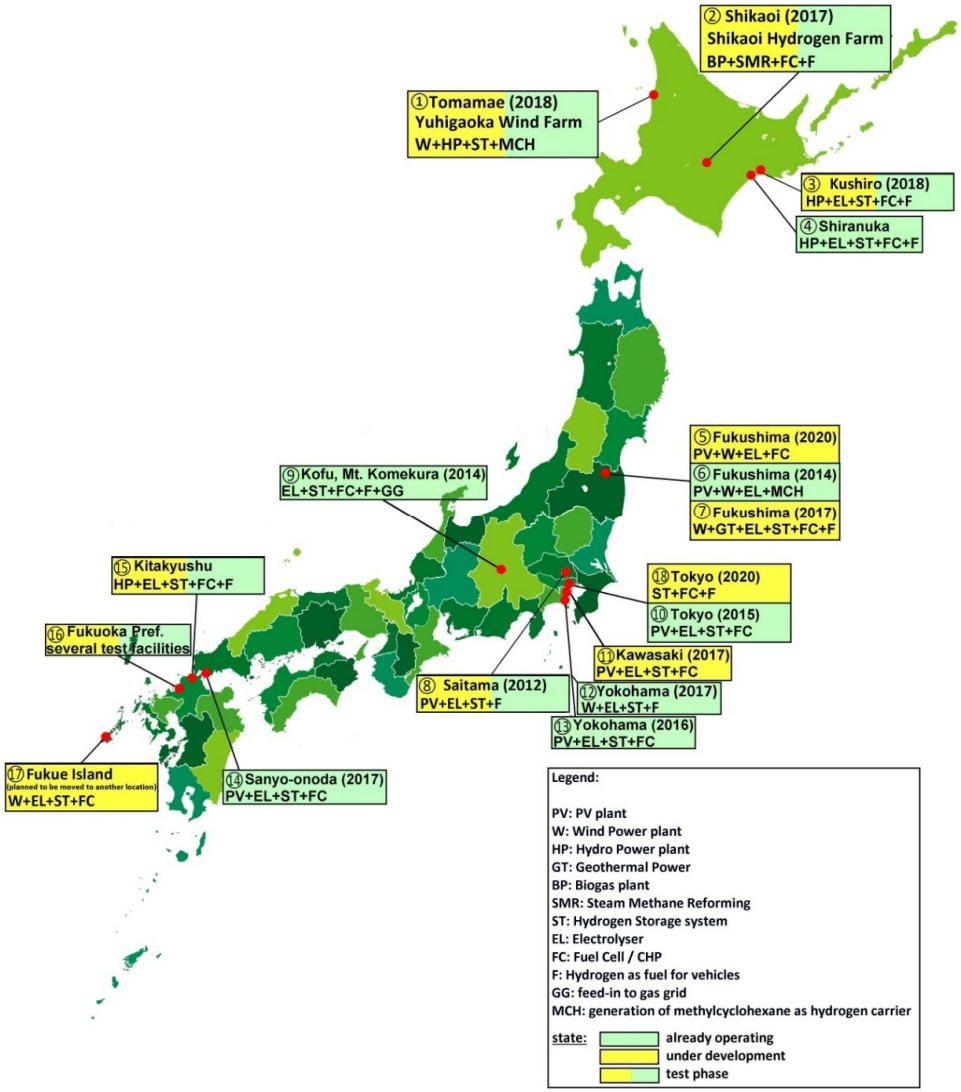
- 160 by FY2020
- 320 by FY2025

Source: NEDO

Agenda

1. Why H2 Society?
2. METI's Basic Hydrogen Strategy & Roadmap
3. PtG Project Examples
4. Ongoing German-Japanese Collaborations

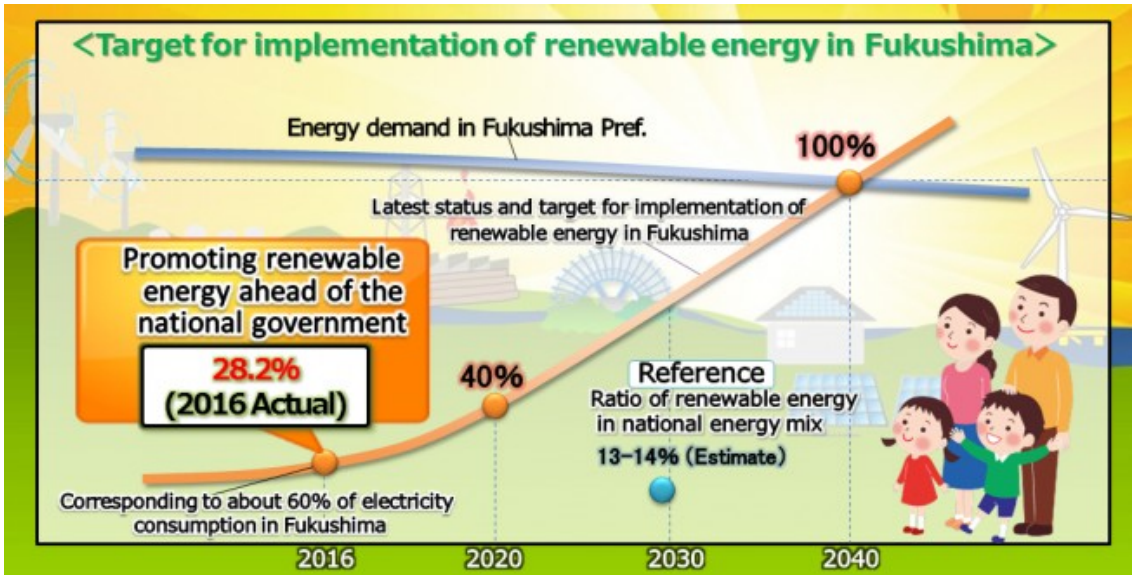
Overview of PtG Projects in Japan

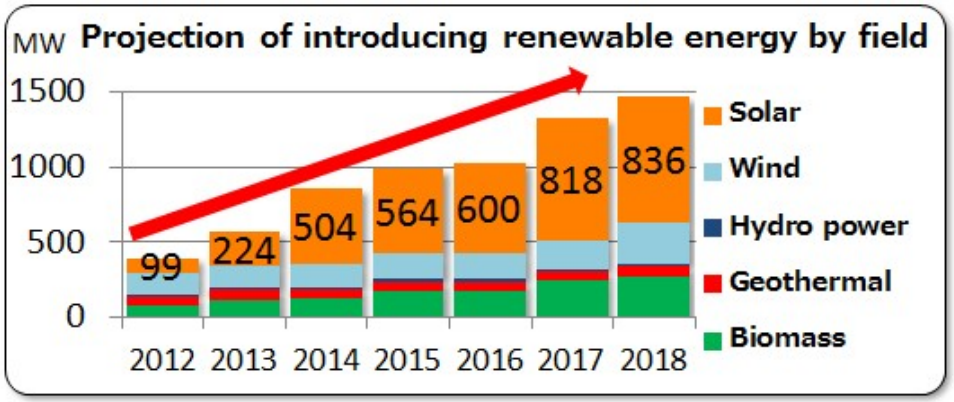


Source: ECOS

Fukushima

On the Way to a Forerunner for Renewable Energy Adoption

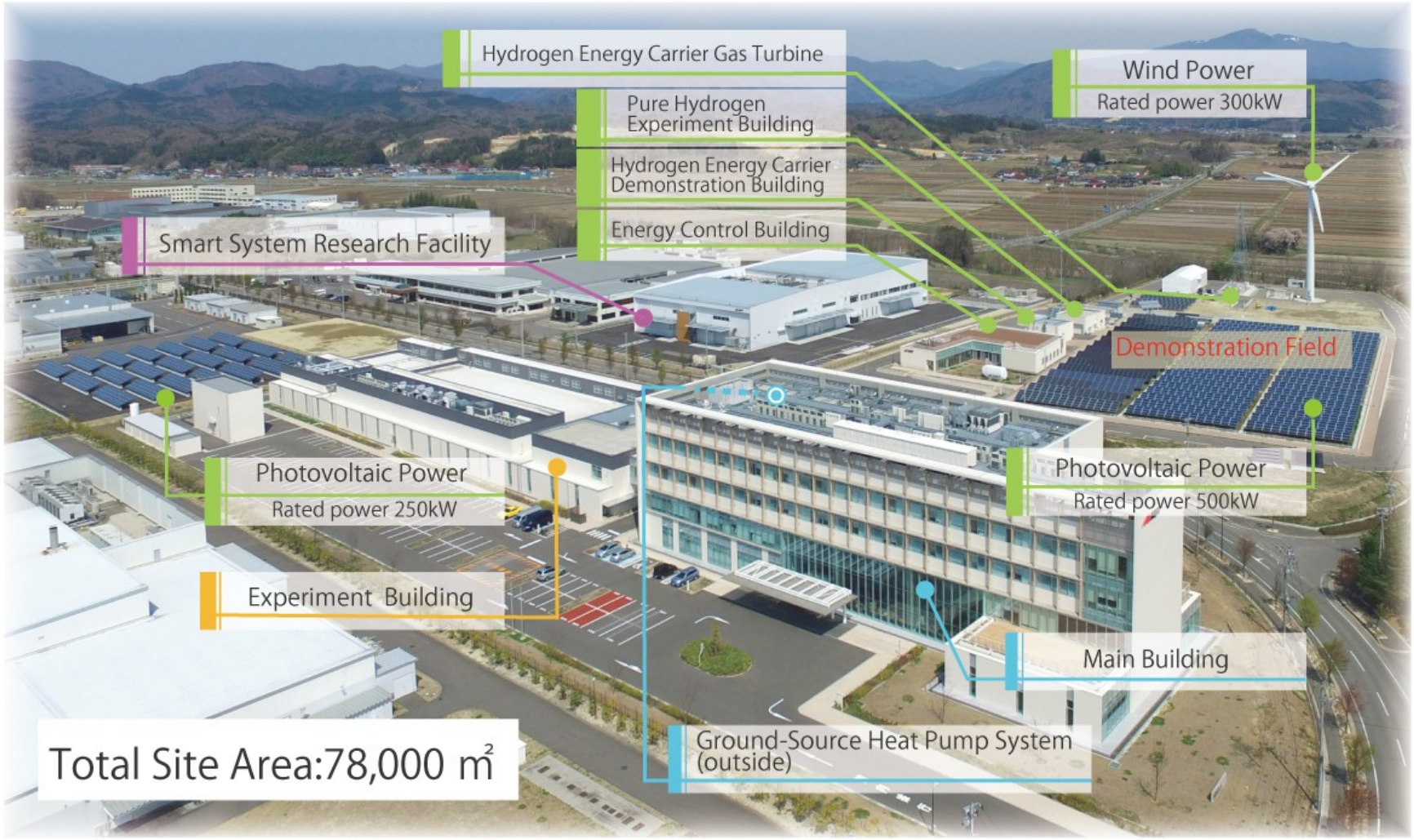




Source: Fukushima Pref.

Fukushima Project

Fukushima Renewable Energy Research Institute, AIST (FREA)



Source: AIST

Fukushima Project

Namie Hydrogen Energy Research Field (FHER)

@ Water purification plant
PV + 24kW electrolysis + Capacitor
- Enhancing PV capacity factor
- Emergency power supply
  / Instead of a diesel power generator

10MW electrolysis / provide H_2 to Tokyo 2020
- Producing "Green Hydrogen" plus Grid Stability

Source: AIST

Tokyo Olympics 2020

Olympic and Paralympic Games Tokyo 2020

A Big Step Toward a Hydrogen Powered Society

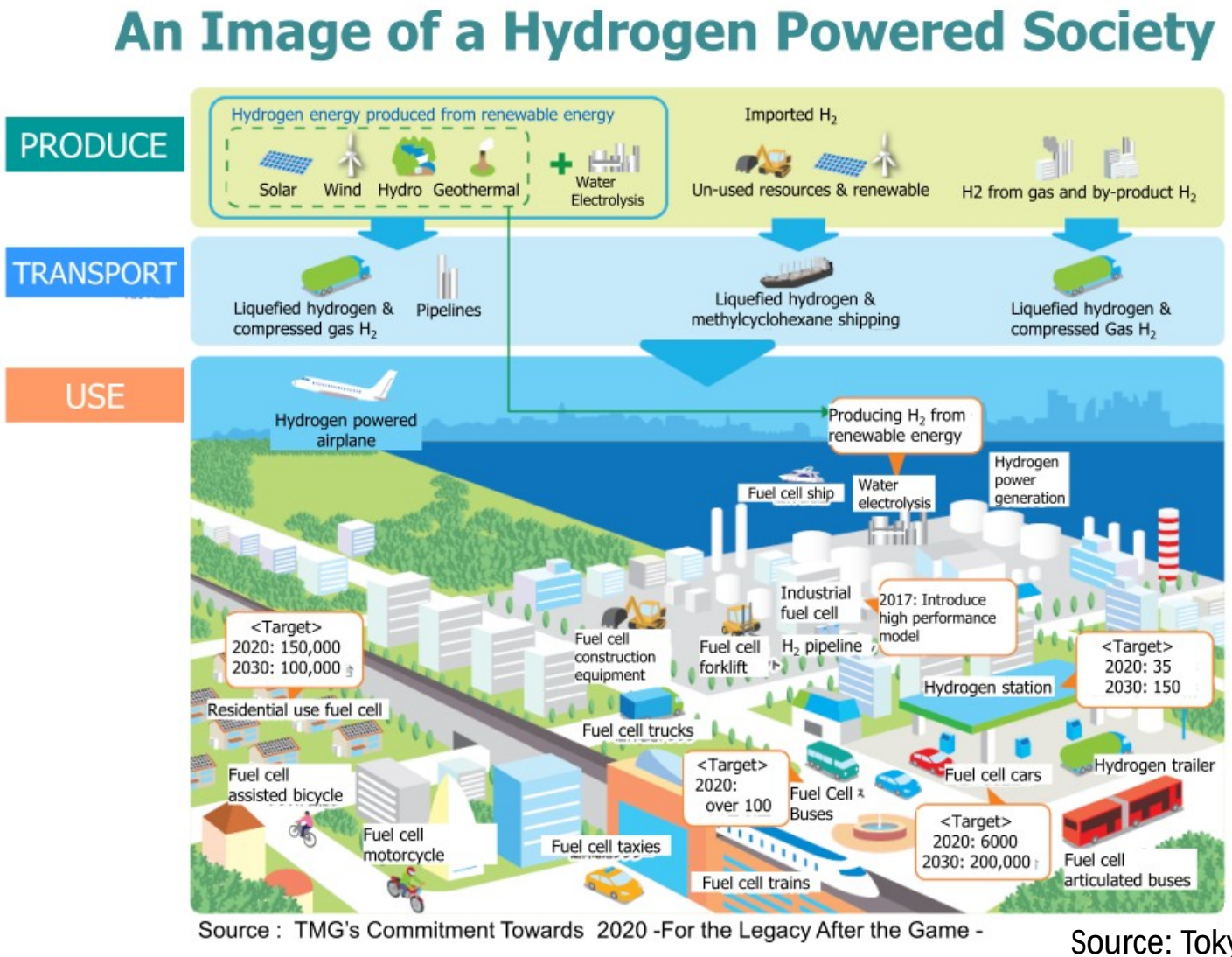
- 100 FC buses
- 5600 appartments equipped with *ene-farms*
- 22 buildings, schools and supermarkets

Image of Athletes' Village (HARUMI)

Athletes' Village to serve as the model for a hydrogen powered society !

Source: Tokyo Metropolitan Government

… and after



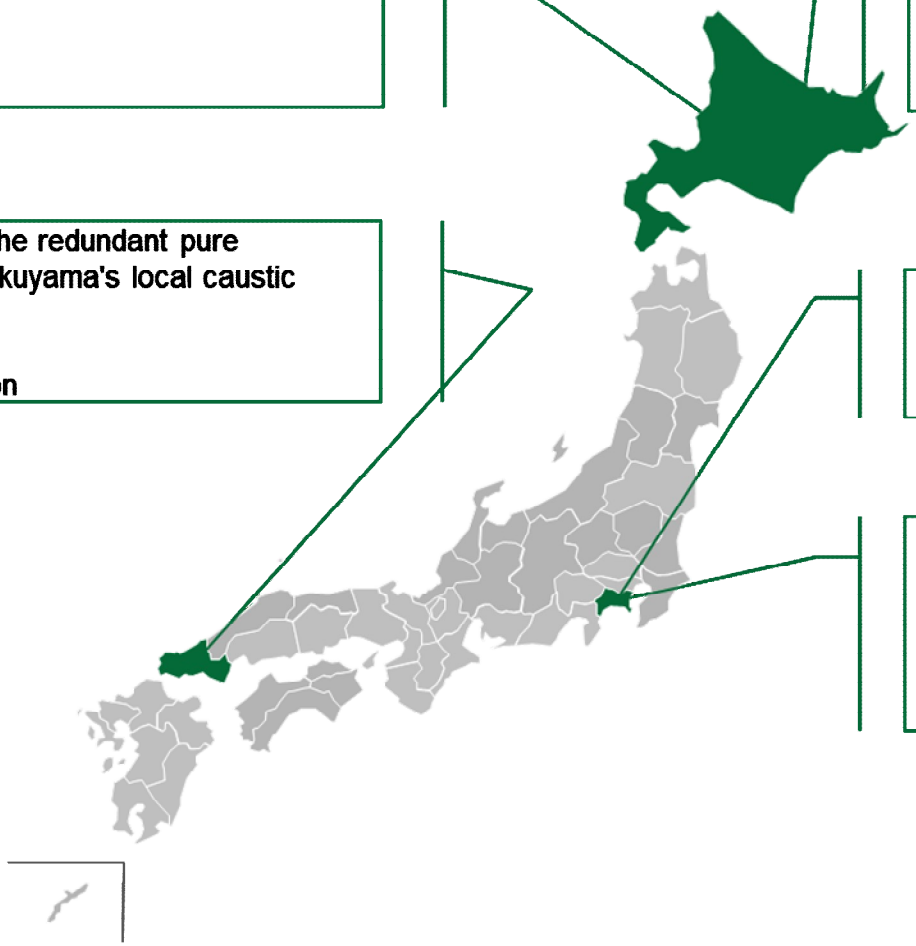
Source : TMG's Commitment Towards 2020 -For the Legacy After the Game -

Source: Tokyo Metropolitan Government

PtG Projects of MoEJ

2. Demonstration using the clean hydrogen (bio gas from livestock excreta)
In Hokkaido
By Air Water INC

3. Demonstration using the redundant pure hydrogen supplied by Tokuyama's local caustic soda plant.
In Yamaguchi Pref.
By Tokuyama Corporation



5. Demonstration using the clean hydrogen (small hydraulic power)
In Hokkaido
By Toshiba Corporation

4. Demonstration using the hydrogen from used plastic
In Kanagawa Pref.
By Showa Denko K.K

1. Demonstration using the clean hydrogen (wind power)
In Kanagawa Pref.
By Toyota Motor Corporation

Source: MoEJ

Agenda

1. Why H2 Society?
2. METI's Basic Hydrogen Strategy & Roadmap
3. PtG Project Examples
4. Ongoing German-Japanese Collaborations

Ongoing Collaborations

- NEDO – NOW: MoU on hydrogen, FC and PtG co-operation
- BMWi – METI: Study on the role of hydrogen in the German and Japanese energy eystem
- German-Japanese Energy Transition Council (GJETC): bilateral study group on “Hydrogen Society”

Thank you for your attention!

www.ecos.eu