

Hydrogen & Fuel Cell



NEDO's R&D program For Hydrogen and Fuel Cell Towards Hydrogen Society

Yoshihiro Shinka
**New Energy and Industrial Technology Development
Organization(NEDO)**

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IPHE Education & Outreach Working Group

“Strategic Road Map for Hydrogen and Fuel Cells” (Agency for Natural Resources and Energy, METI)

Phase 1

**Dramatic expansion of hydrogen use
(Full-fledged introduction of fuel cells into society)**

Release onto the market: residential fuel cells in 2009; Fuel cell vehicles in 2015

2017

Releasing fuel cells for commercial and industrial use onto the market

Around 2020

Achieving a reduction of hydrogen price to a level equal to or lower than that of fuels for hybrid vehicles

Around 2025

Fuel cell vehicles: Achieving a reduction of vehicle prices to the level of hybrid vehicles of the same class and price range

Phase 2

**Full-fledged introduction of hydrogen power generation/
Establishment of a large-scale system for supplying hydrogen**

Accelerating development and demonstration
Establishing a strategic partnership with hydrogen-suppliers overseas
Realizing inexpensive hydrogen , anticipating growth in demand

Mid 2020s

-Plant delivery price of hydrogen from overseas: 30 yen/Nm3 -Building up a commercial-based domestic system for efficiently distributing hydrogen

Around 2030

-Full-fledged operation of manufacturing, transportation and storage of hydrogen derived from unutilized energy resources imported from overseas
- Full-fledged introduction of hydrogen power generation for power-producing business

Phase 3

Establishment of a zero-carbon emission hydrogen supply system throughout the manufacturing process

Systematic development and demonstration of such a system, based on its potential for development

Around 2040

Full-fledged operation of manufacturing, transportation and storage of zero-carbon emission hydrogen, by combining the manufacturing technology with a CCS process or with making use of domestic and overseas renewable energy

Conveying to the world the information on the potential of hydrogen by taking advantage of the 2020 Summer Olympic Games in Tokyo

2020

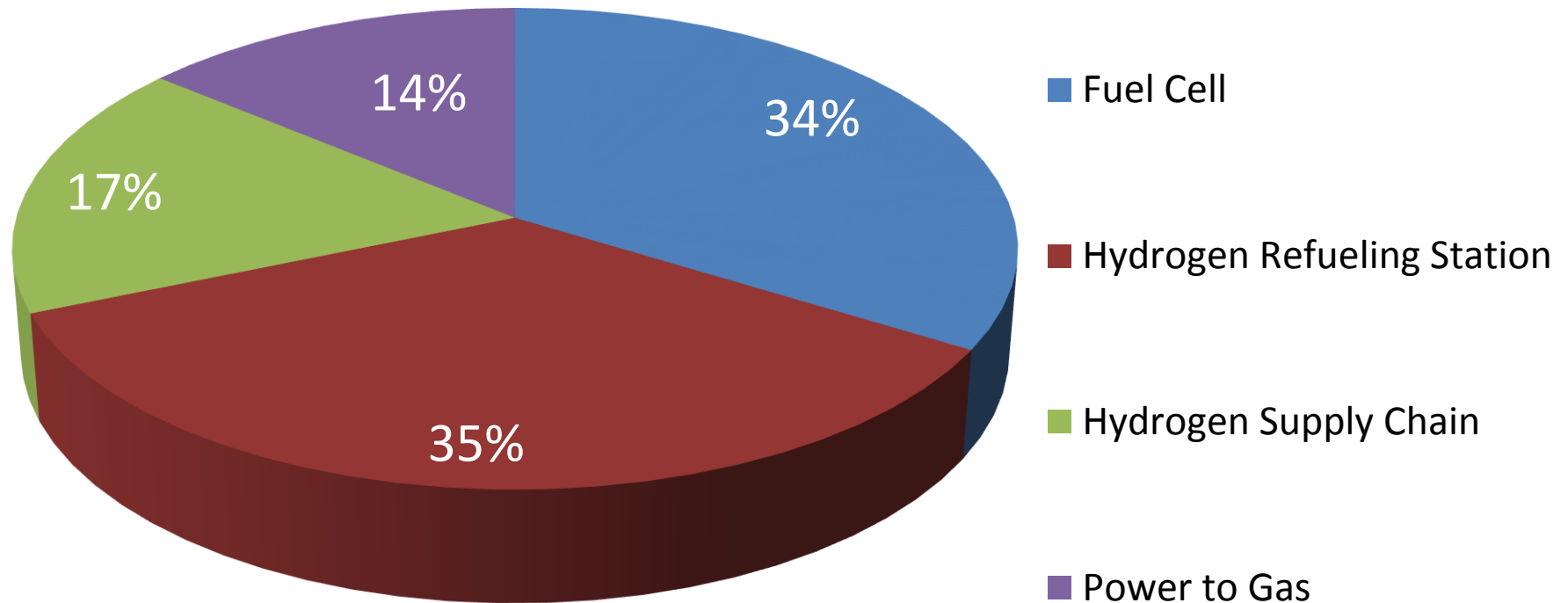
2030

2040

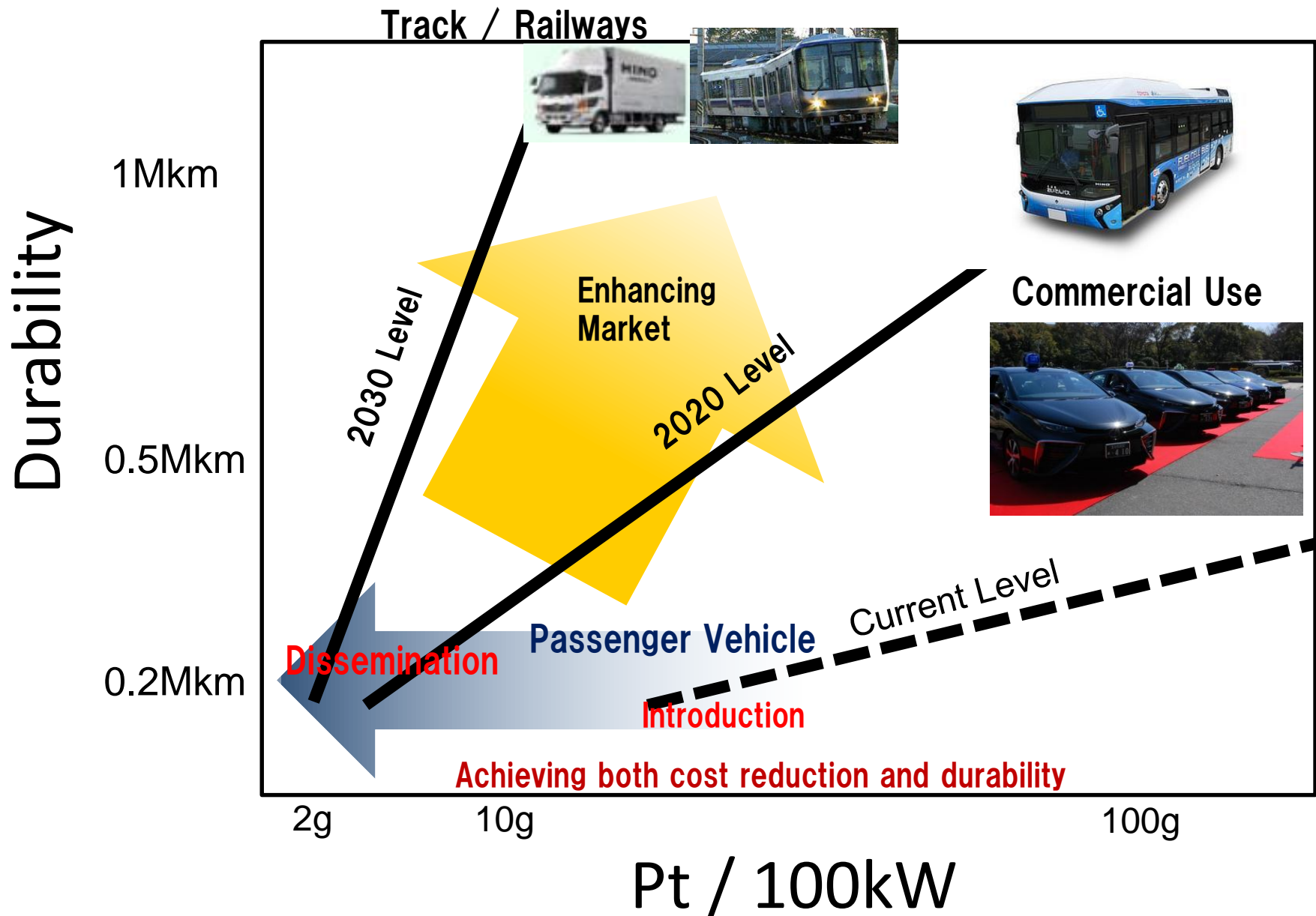
Market scale of the equipment and infrastructure businesses related to hydrogen and fuel cells in Japan
Approx. 1 trillion yen in 2030 → **Approx. 8 trillion yen in 2050**

NEDO's Activities

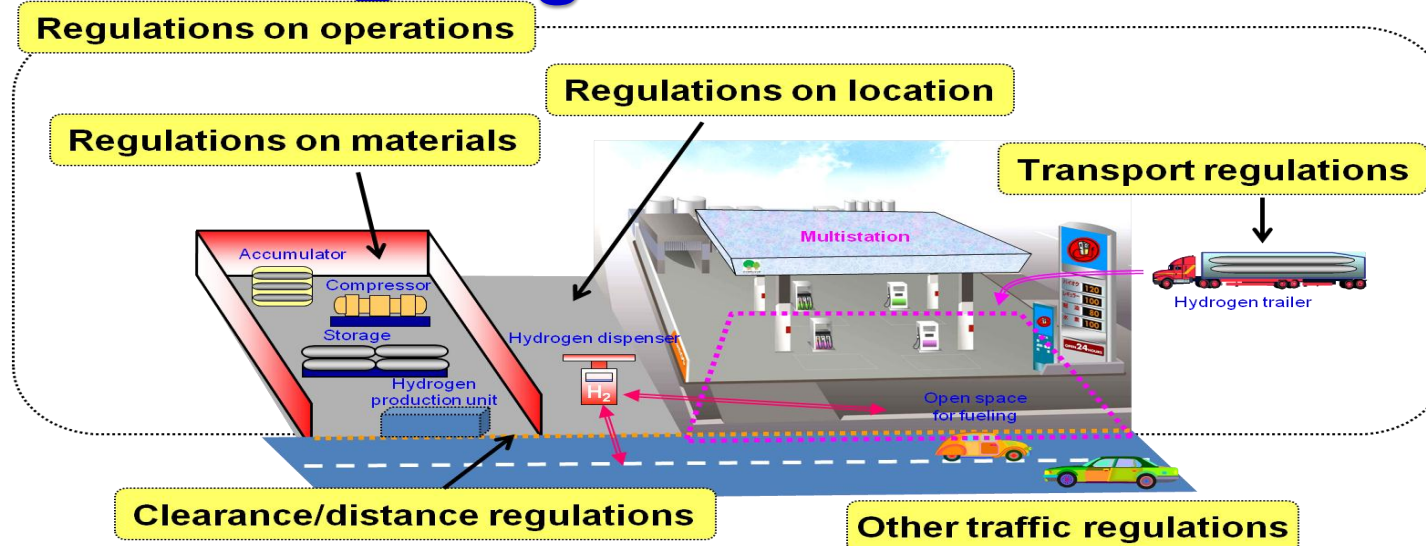
NEDO's Budget for Hydrogen Energy in 2015



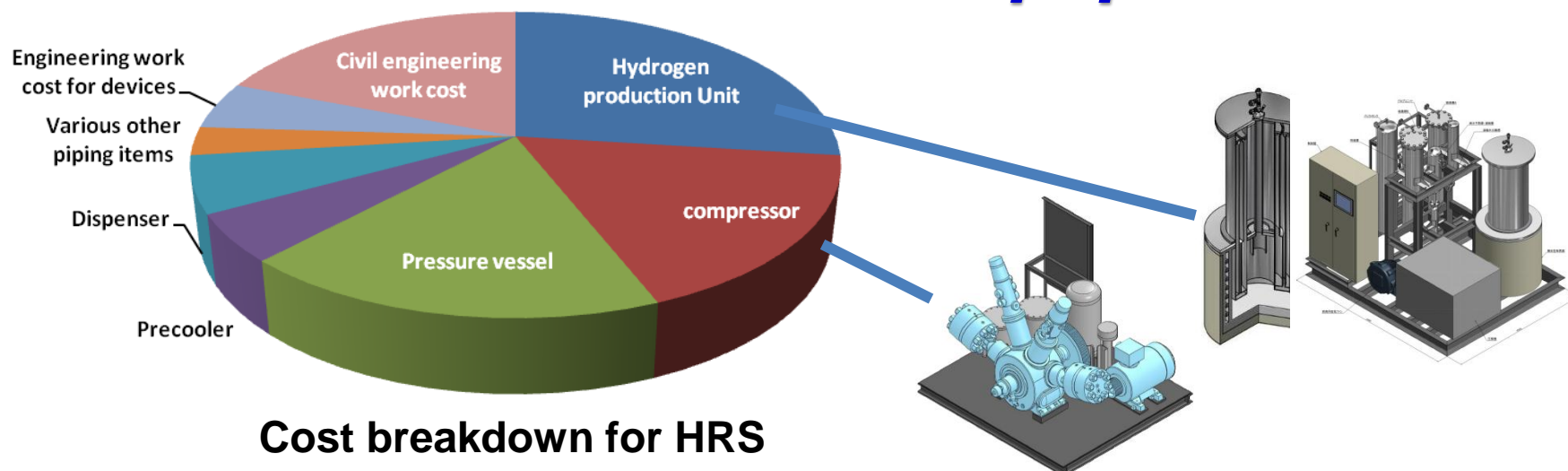
Total: JPY 11,860 million (US\$100 million)



Streamlining Regulation

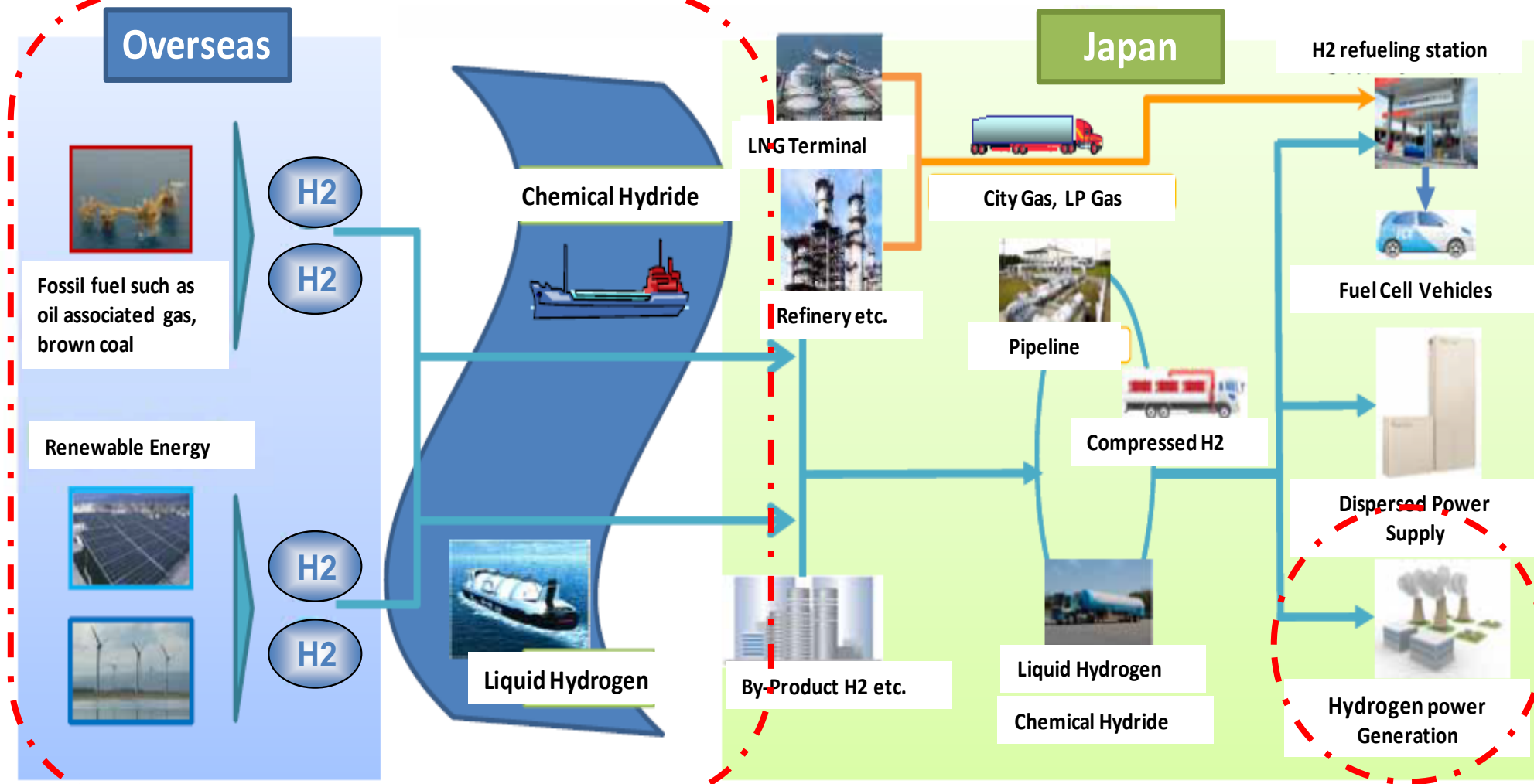


R&D for Cost Reduction of Equipments

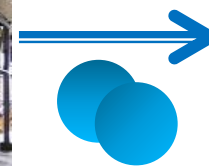
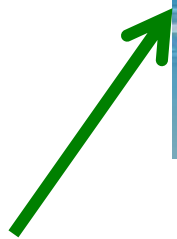


Develop Hydrogen Demand

Future image of production, storage, transportation and utilization

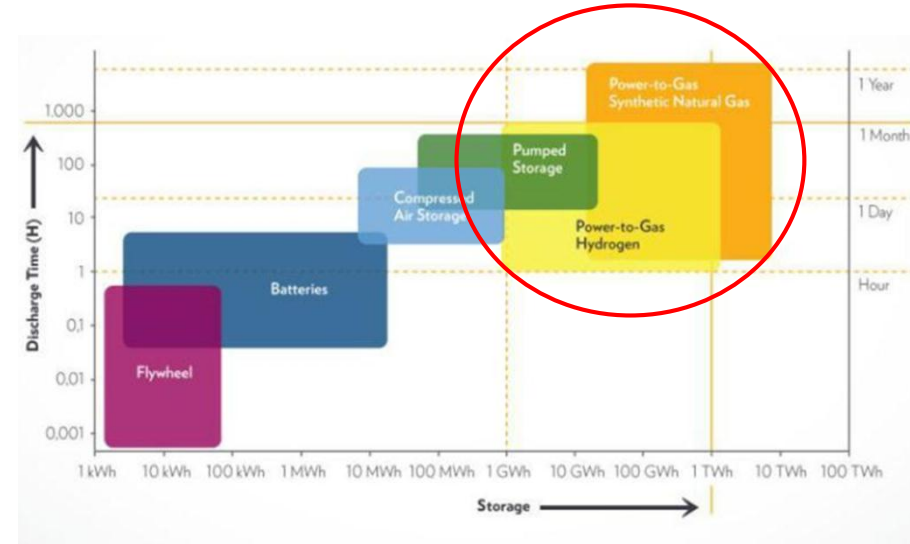


Enhancing RE Potential w/ Hydrogen



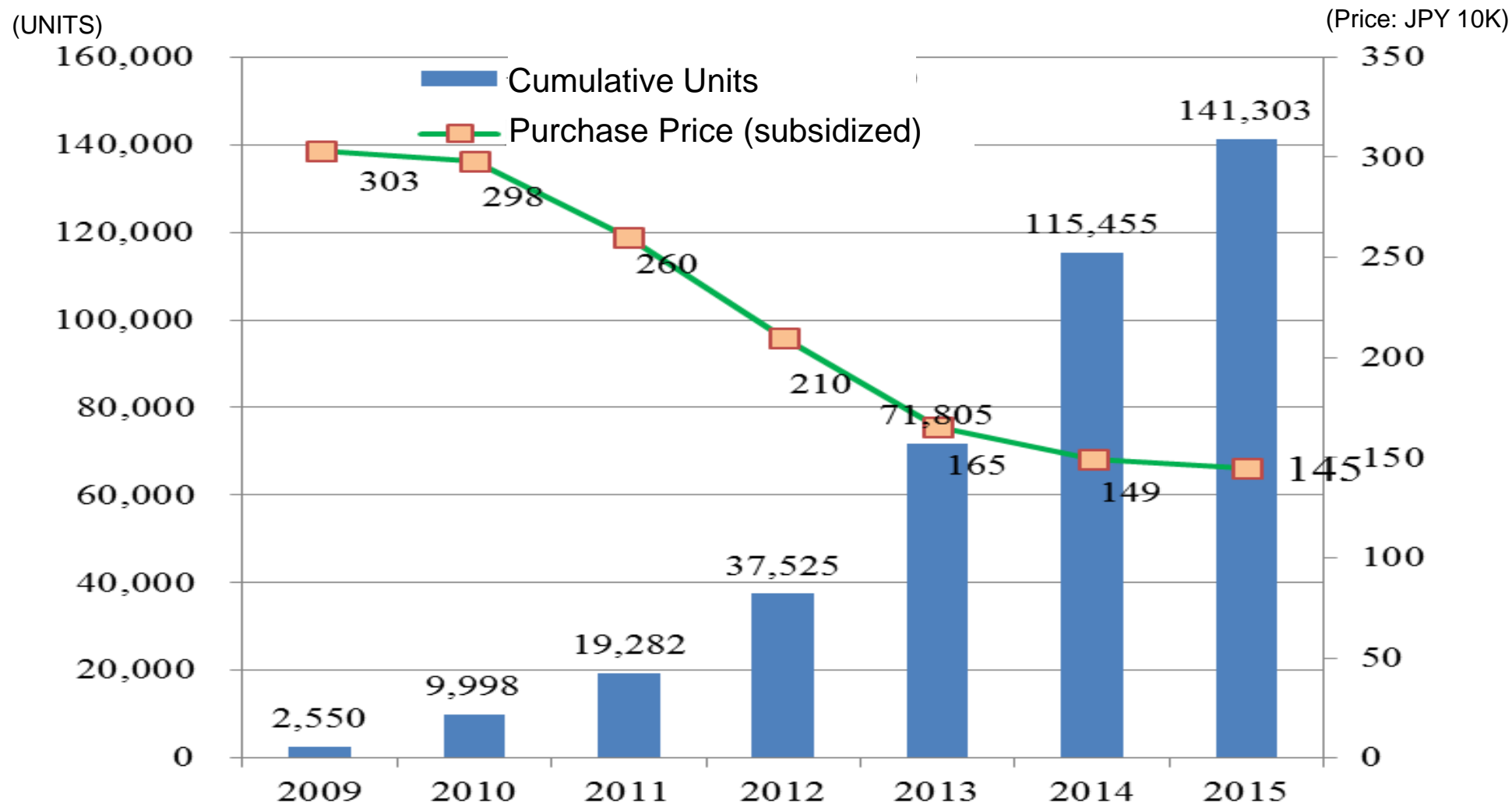
Grid-stabilization
Utilization of Excess Energy

- Electricity
- Thermal
- Mobility , etc.



Current Status

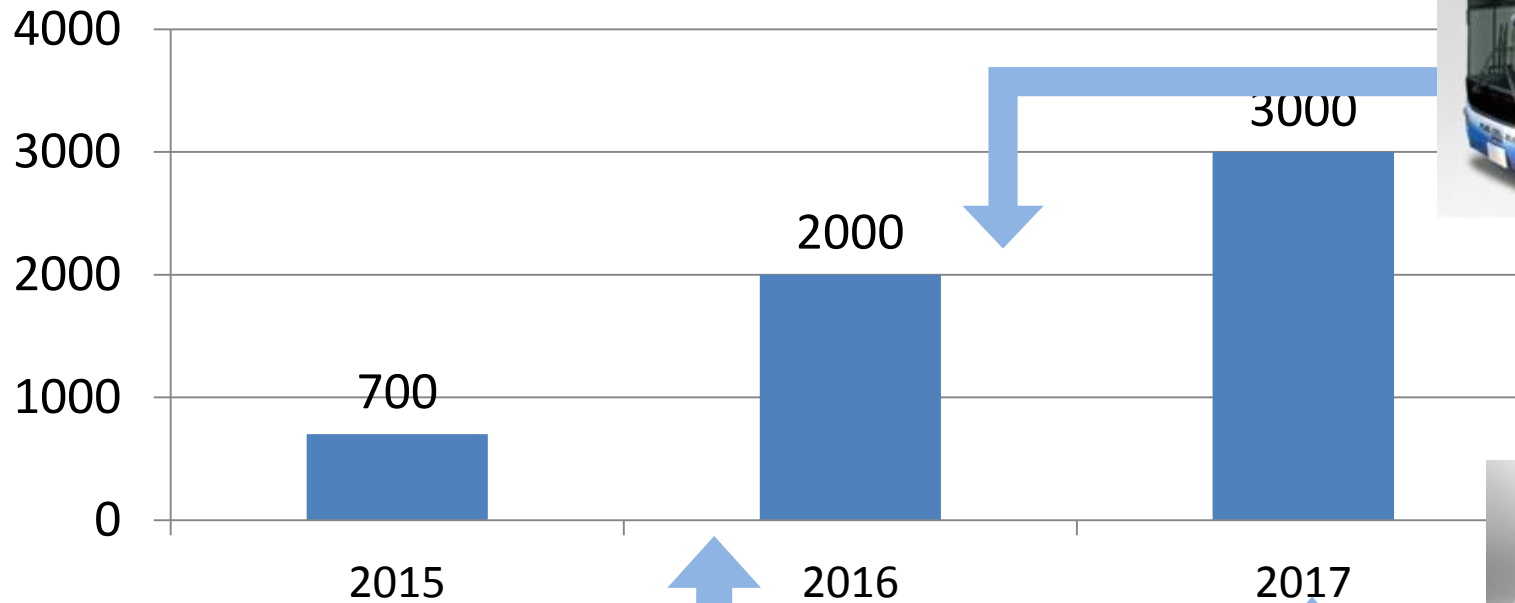
ENE FARM: Installed unit & Purchase price with subsidy



(As of Sep)

Source: METI

Expected Production Number (Toyota)



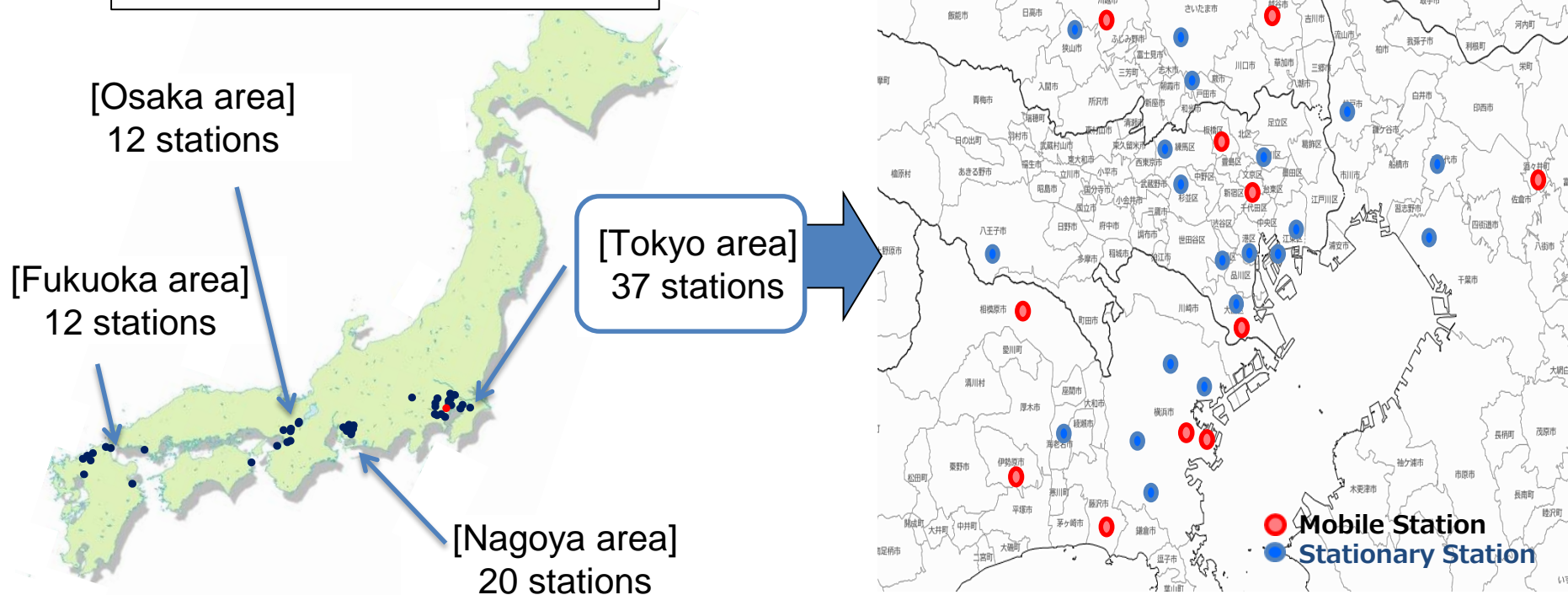
(Photo from website (Toyota, Honda, Nissan, Hino))

Deployment of Hydrogen Refueling Stations (HRSs)

- Target: 100 HRSs in 4 major populated areas
- METI subsidizes around 1/2 or more of capex and 2/3 of opex

Status of HRSs (as of Nov 2015)

- Budget secured: 81 stations
- Open: 31 stations





www.nedo.go.jp

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