A scenic landscape of a Japanese lake with a forested island and a mountain in the background. The text is overlaid on this image.

Fuel Cells / H2 R&D and commercialization activity in Japan

An Update

**Fuel Cell Promotion Office,
New and Renewable Energy Policy Division
Agency for Natural Resources and Energy,
Ministry of Economy, Trade and Industry,
Japan.**

Expected Targets and Policies for FCs

FCV



Stationary PEFC



2002 -

R&D Stage

2005-

Introduction Stage

2010-

Diffusion Stage

2020-

Full-Scale
Diffusion Stage

Infra

Demonstration
Project

Stepwise
Construction

Market growth
without support

Organic
Growth

Codes

Review of
Regulations

R&D

R&D on
FC and H₂

Further R&D for higher
performance and low cost

FY2008 Total budget : 28.9 billion yen

Updates

I. Residential Fuel Cells

II. Fuel Cell Vehicles and Infrastructures

III. Basic Researches activity in FC/H2 front

Residential PEFC Demonstration Project

- Preparation for the large-scale commercialization -



Commercial launch

販売開始

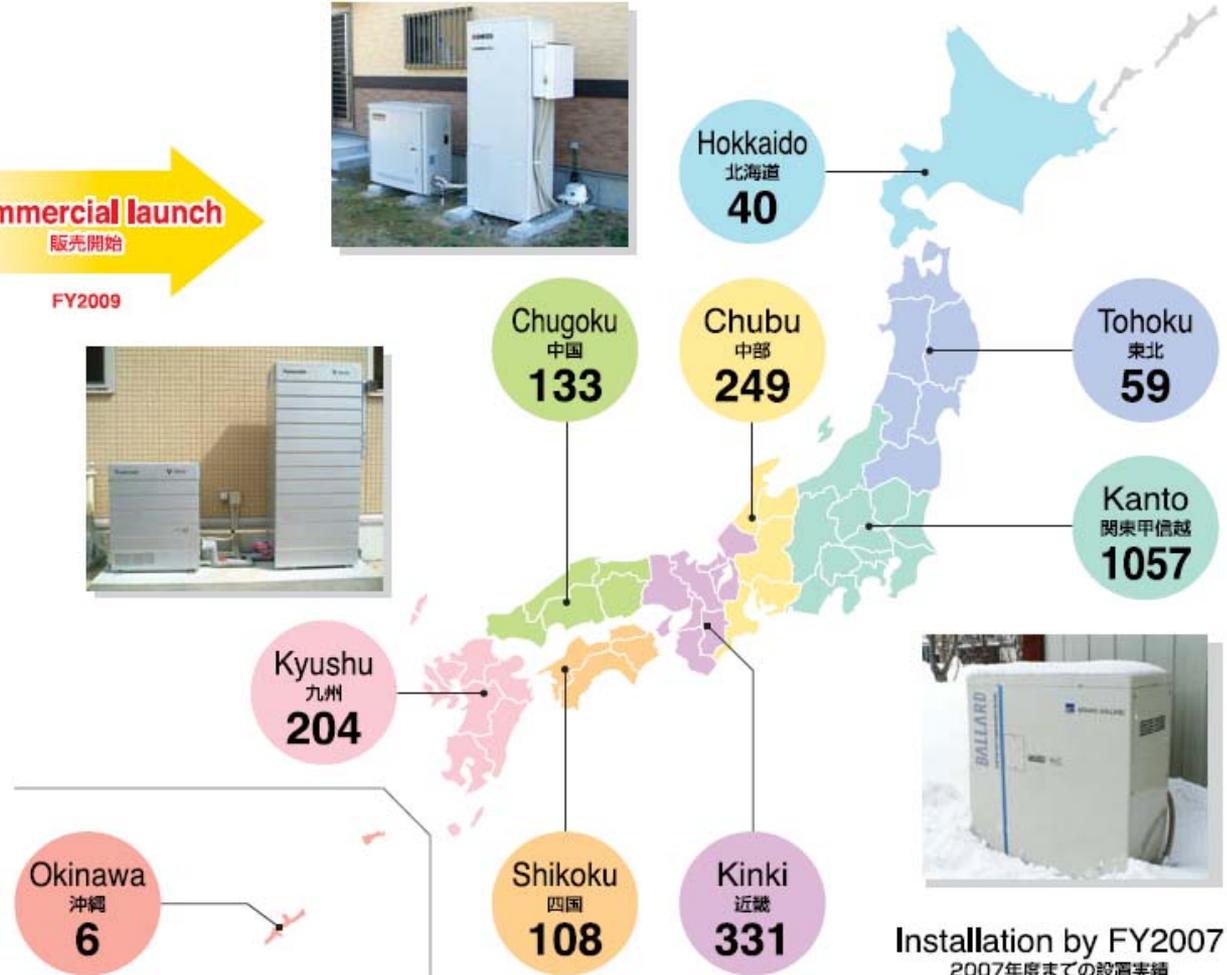
FY2009



Breakdown by Fuel

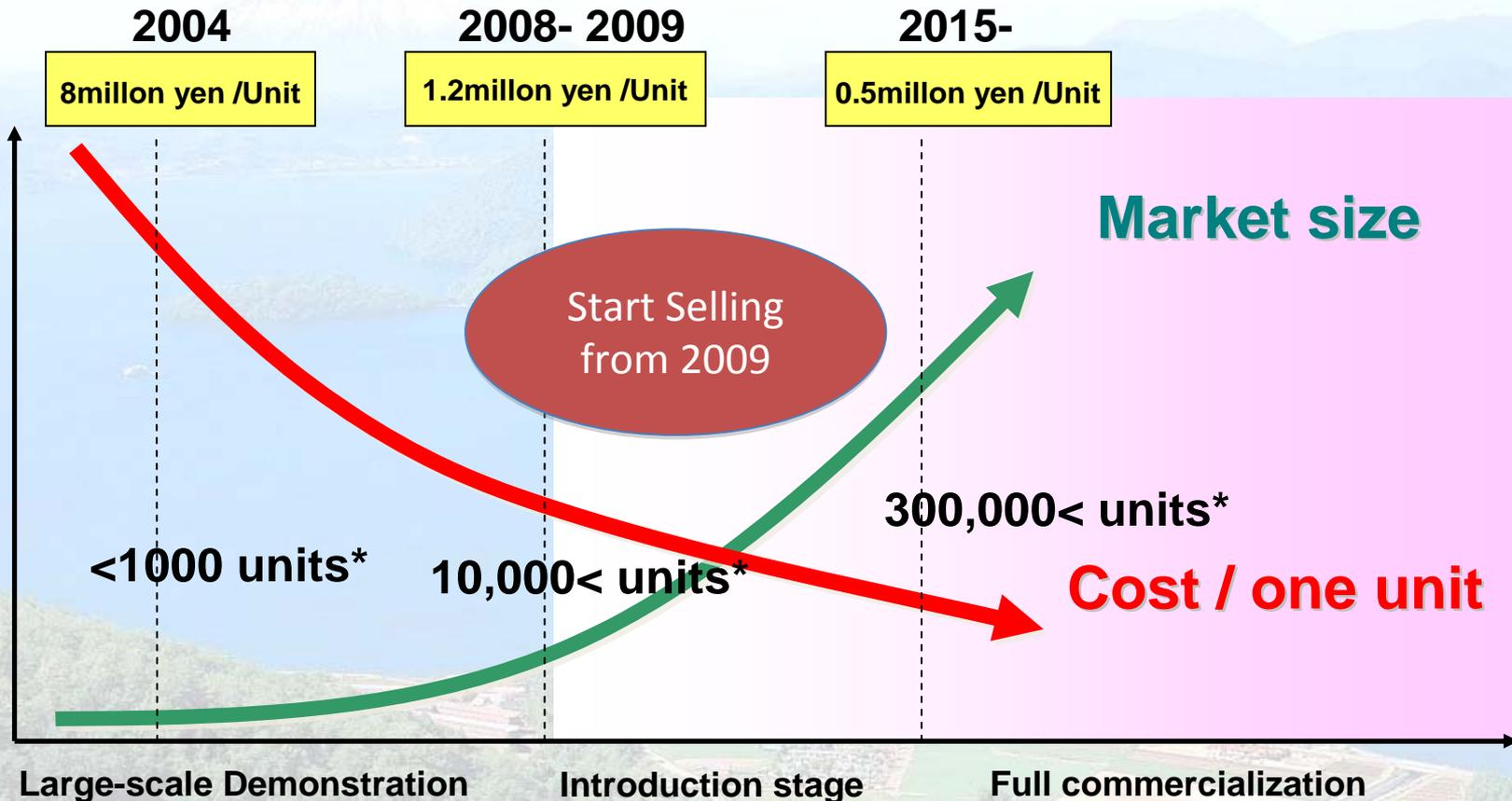
燃料別内訳

Fuel 燃料	Systems 設置台数
LPG (Propane) LPガス	1,618
Natural Gas 都市ガス	1,375
Kerosene 灯油	314
Total 合計	3,307



Installation by FY2007
2007年度までの設置実績

Scenario of Market Creation for Residential Full Cell



Note: * means annual production rate

Fuel Cell Market Entry I

- Commercialization of Residential Fuel Cells -



A naming ceremony (June 25th)

The participants of current "Residential FC Demonstration Project"



"ENE FARM" - The unified logo for Residential Fuel Cells



Fuel Cell Market Entry I

- Commercialization of Residential Fuel Cells -



“The first shipping” ceremony at Matsushita’s new plant for Residential PEFC.

Matsushita launched a new production line special for FC. (July 1st)

Demonstration of Residential Fuel Cells at Toyako Summit ---- “Footbath”

The Ministry of Economy, Trade and Industry (METI) built a model house called the “Zero-Emission House” in the outdoor car park of the International Media Center (IMC) for coverage by international journalists during the Hokkaido Toyako Summit (July 7th~9th.)

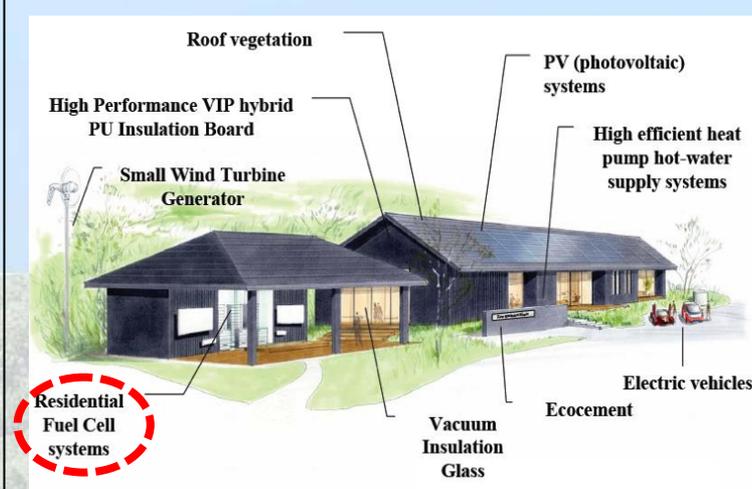
FC powered “footbath”

Three different types of 1kW scale FC are installed and connected each other to supply both electricity and hot water.

- Natural Gas type
- LPG type
- Kerosene type



1kW scale Residential Fuel Cell System



Outline of the “Zero-Emission House”

Demonstrative house with state-of-the-art green technology including residential fuel cell, photovoltaic power generation, Organic LED lightning, Small wind turbine generator, the latest robot, etc.

Floor space: Approximately 280 m² (residential section: approx. 200 m², footbath section: approx. 80 m²)

Demonstration of Fuel Cell Vehicles at *Toyako Summit*

Four FCVs and five FC buses gathered at the Toyako Summit to promote FC's profile together with the attractive demonstration of FC powered footbath in Zero-emission house. (July 7th~9th.)



Shuttle Bus : The five FC buses and five off-site relocatable hydrogen stations gathered at Toyako for transportation between Windsor Hotel Toya (summit meeting hotel) and the check points.

FCV : The next-generation vehicle including four FCVs were displayed and used for test driving at the car park of International Media Center, Rutsusu.



Fuel Cell Market Entry II

- Commercialization of FCV and hydrogen stations -

Specifications of the advanced Fuel Cell Vehicles developed by Toyota and Honda were disclosed recently. The elongated cruising range was achieved through improved stack efficiency in FCX Clarity, while the FCHV-adv's cruising range exceed 500miles by introducing 70MPa high pressure hydrogen tank.

HONDA FCX Clarity (July 2, 2008)



Cruising Range : 620km (390miles)
Fuel Cell Stack : 100kW
Top Speed : 160km/h (100mph)
Pressure of Hydrogen Tank : 35MPa

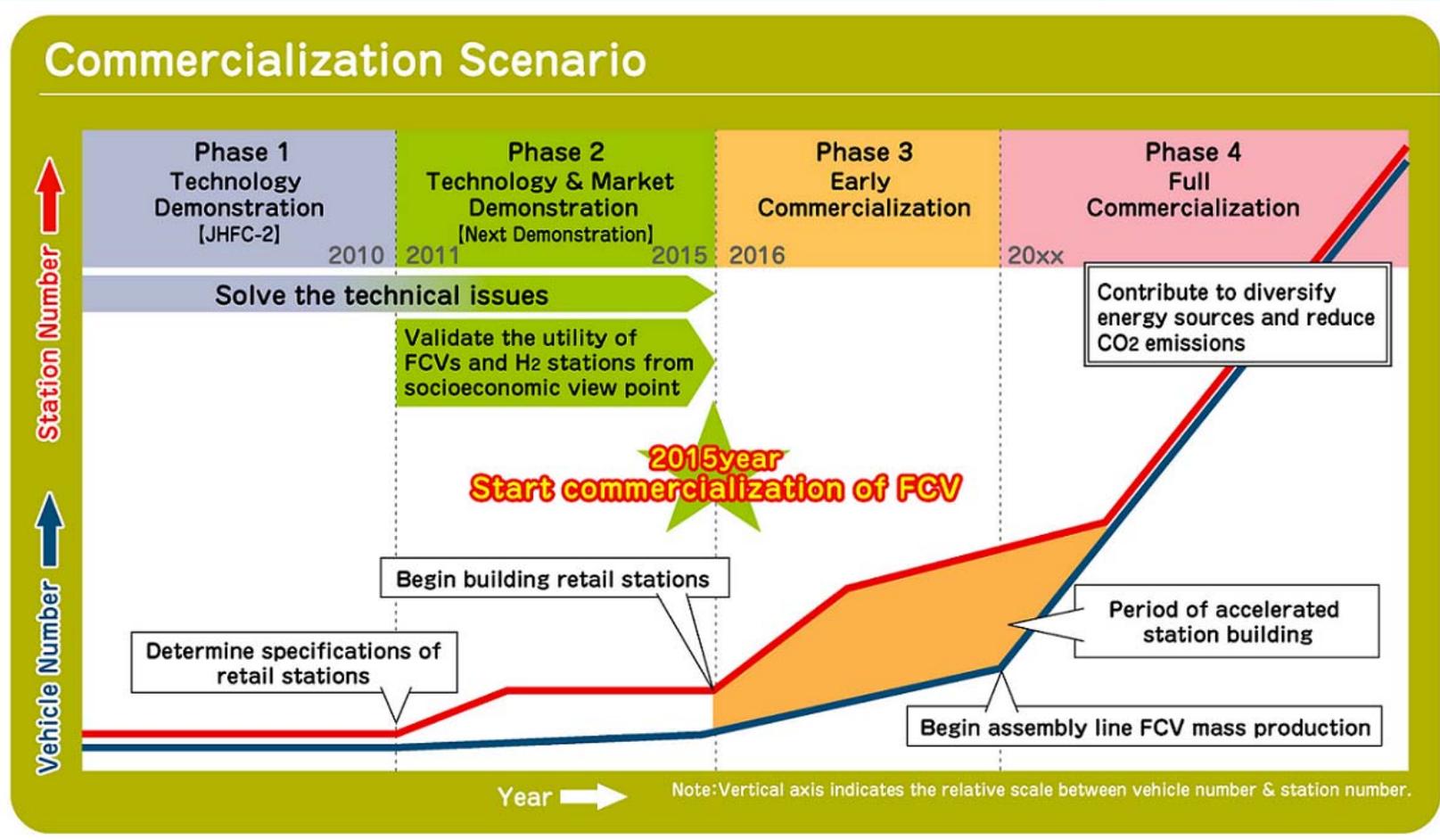
TOYOTA FCHV-adv (June 6, 2008)



Cruising Range : 830km (520miles)
Fuel Cell Stack : 90kW
Top Speed : 155km/h (97mph)
Pressure of Hydrogen Tank : 70MPa

Fuel Cell Market Entry II

- Commercialization of FCV and hydrogen stations -



Leading automakers in and outside Japan and Japanese energy companies have agreed on a scenario which sees commercialization of fuel cell vehicles (FCVs) and hydrogen stations beginning in 2015.

Basic Research for profound understandings of Science in FC/H2 ; toward next step R&D

1. Advanced Fundamental Research on Hydrogen Storage Materials (FY2007~FY2011) (AIST)

HYDROSTAR, Fundamental Research on Hydrogen Storage Materials.

- Utilization of advanced probes such as synchrotron radiation and neutrons for fine structure analysis.
- Collaboration with top class laboratories outside of Japan (**Los Alamos National Institutes.**)
- Concentrative collaborations of 14 institutes in Japan including AIST as a core site.



2. Polymer Electrolyte Fuel Cell Cutting-Edge Research Center (FY2005~FY2009) (AIST) FC-Cubic, Fundamental Research on PEFC

- Detailed analysis and modeling of reaction mechanism inside fuel cells.
- 31 researchers from company and university.



FC-Cubic (Est. 2005)



3. Research Center for Hydrogen Industrial Use and Storage (FY2006~FY2012) (Kyushu Univ., AIST) HYDROGENIUS, Basic research on materials used in hydrogen.

- Basic researches on materials embrittlement, hydrogen tribology.
- Participation of world class researchers (approx. 100 scientists) (18 researchers from 9 countries including USA, France, China, Ukraine, Israel)



HYDROGENIUS Main building



4. Basic materials research for High Performance Fuel Cell (FY2008~FY2014) (Yamanashi Univ.)

HiPer-FC Project

- Development of high performance PEFC based on the state-of-the-earth science.
- Materials researches based on the advanced analysis of reaction and degradation with nanometer scale.

Summary

Residential Fuel Cell

- Start Selling in 2009
- FC unit manufacturers / energy enterprises / political support : under preparation

Fuel Cell Vehicles

- “Start Selling in 2015” scenario was adopted

Basic Researches

- Four research centers to study fundamental aspect of FC to achieve enhanced performance/cost

Thank you for your kind attention.