Activities of The Research Association of Hydrogen Supply/Utilization Technology

June 4th, 2010

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The Research Association of Hydrogen Supply/Utilization Technology

Contents

Outline of HySUT

Objective:
Contribution to preparing of circumstances toward FCV deployment
(Technology, Standard, Consumer acceptance, Social system)
by operating "Demonstration Test".

1. Establishment： 2009.7.31

2. Members：

(1) Energy Supplier

NIPPON OIL CORPORATION, IDEMITSU KOSAN CO., Ltd. , COSMO OIL CO., Ltd. ,
JAPAN ENERGY CORPORATION , Showa Shell Sekiyu. K.K.

TOKYO GAS CO., Ltd., OSAKA GAS CO., Ltd., TOHO GAS CO., Ltd., Saibu Gas Co., Ltd.

IWATANI CORPORATION

(2) Industrial Gas Company, Engineering Company, Device Company

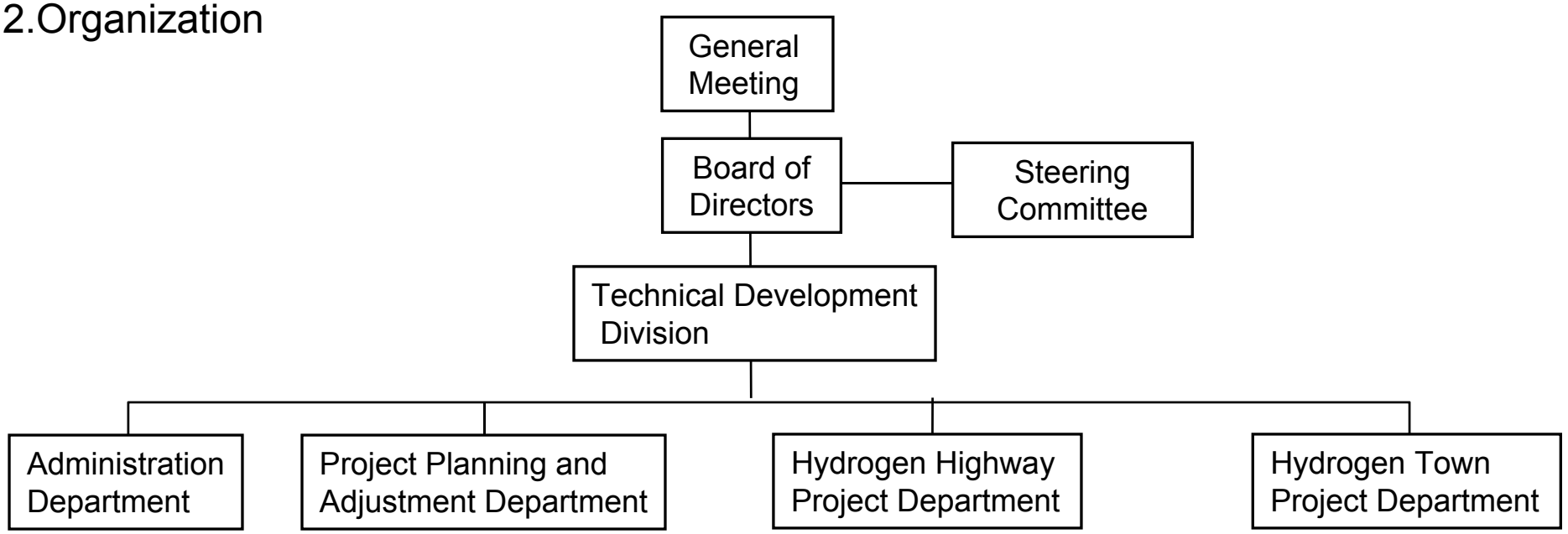
Air Liquid Japan Ltd., KAWASAKI HEAVY INDUSTRIES, Ltd.,
MITSUBISHI KAKOKI KAISHA, Ltd., TAIYO NIPPON SANSO Corporation

Organization and Structure of HySUT (at the time of June 4th, 2010)

1. Employees

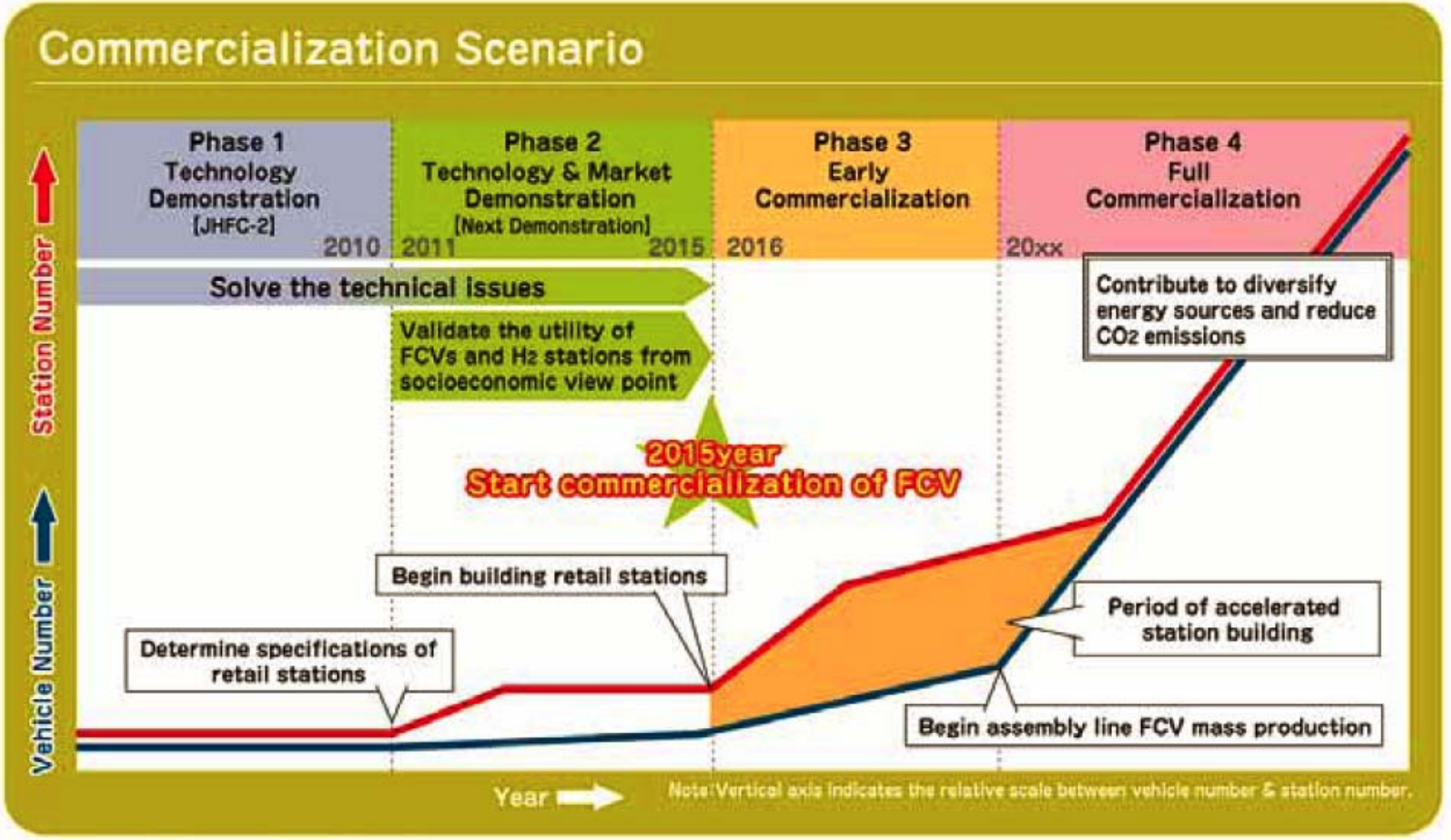
24 (7 full time employees, 17 double as their own companies)

2.Organization



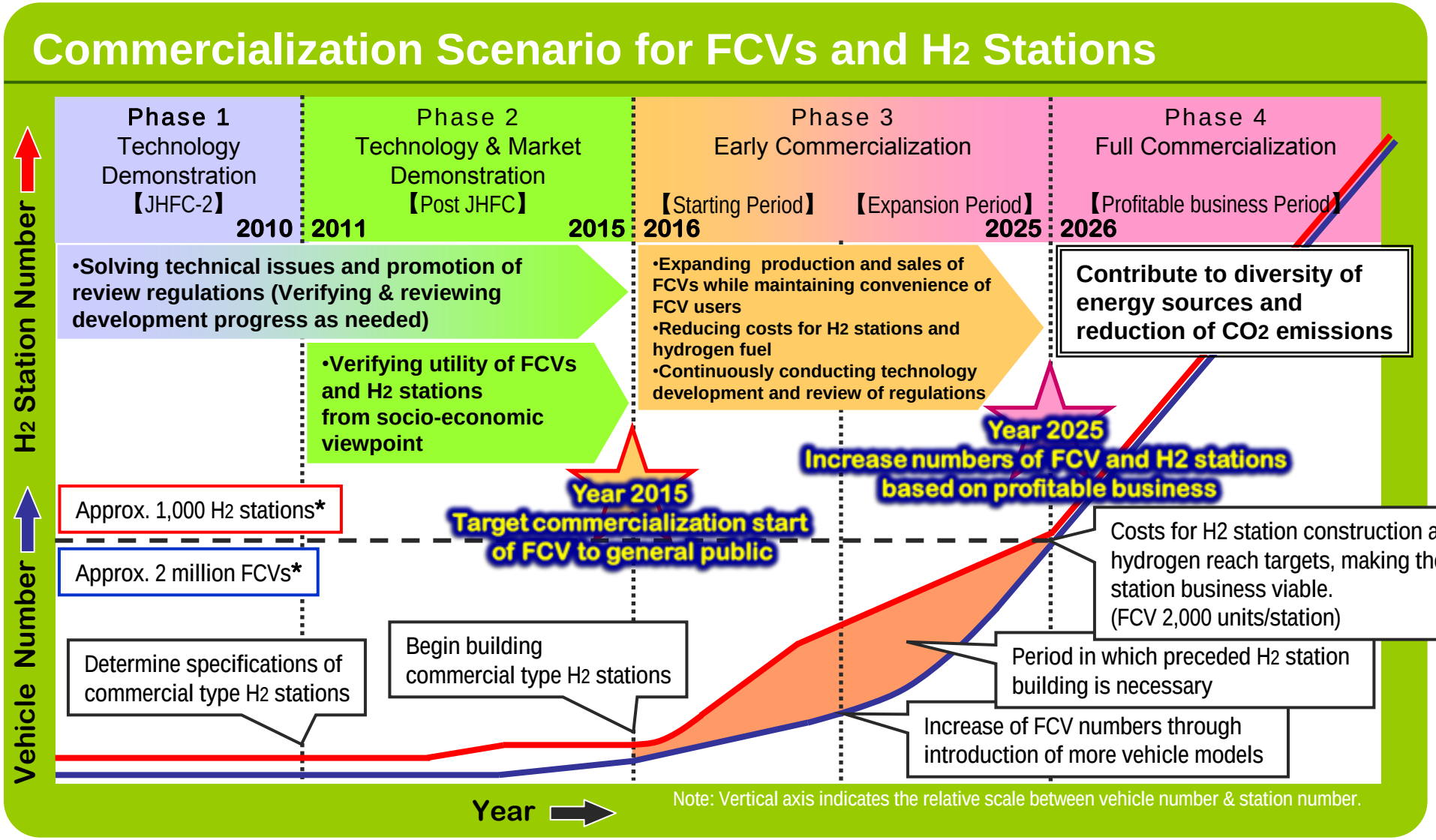
Commercialization Scenario of fuel cell vehicles and hydrogen stations

Reference : FCCJ Press Release, July 4, 2008



Commercialization Scenario of fuel cell vehicles and hydrogen stations (Renew)

Reference : FCCJ, March 2, 2010



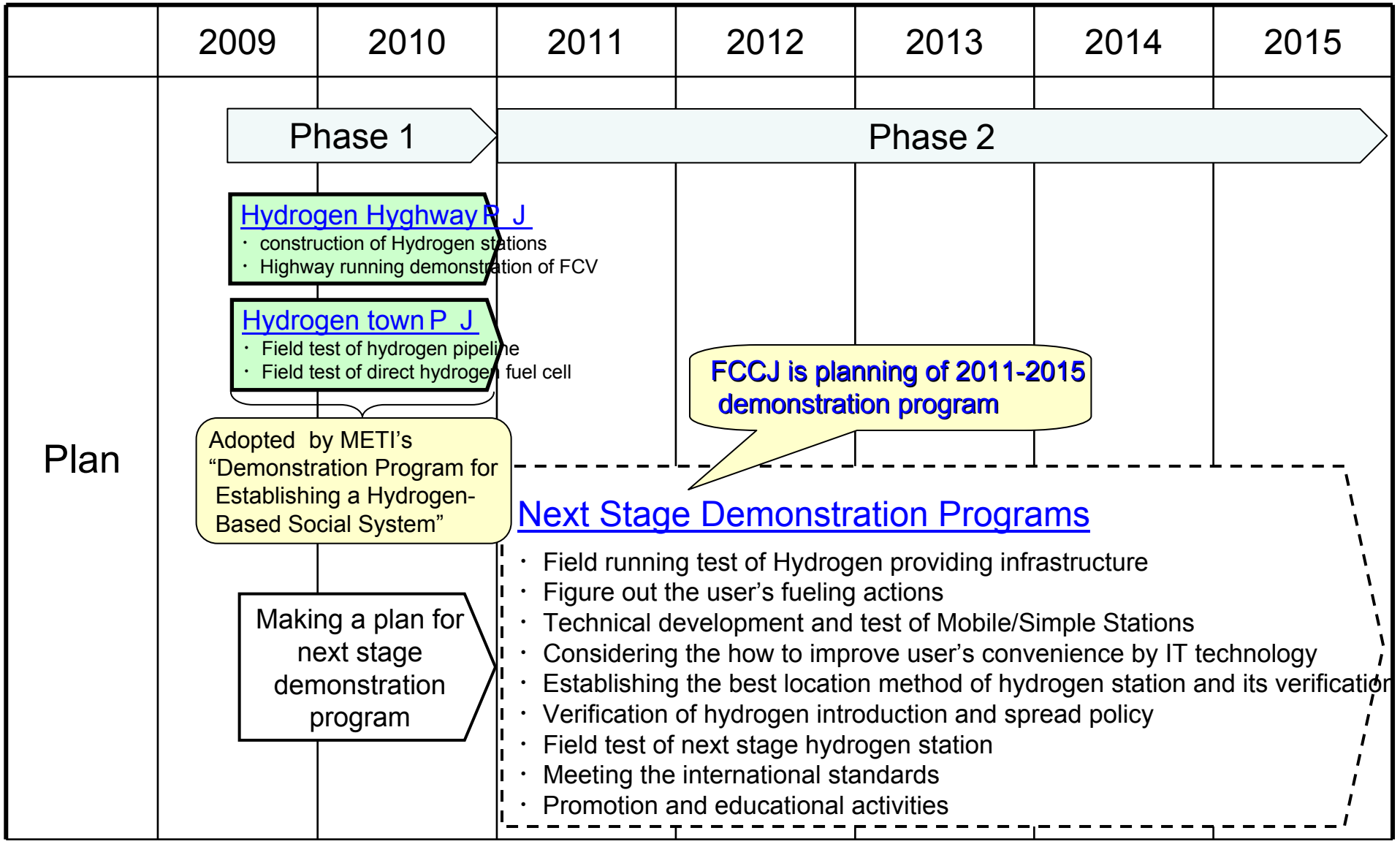
* **Precondition: Benefit for FCV users (price/convenience etc.) are secured, and FCVs are widely and smoothly deployed**

1. Outline and Background of establishment of HySUT

2. Present Activities of HySUT

3. Commercialization Problem of FCVs and H2 stations

HySUT's Plan of Demonstration Programs

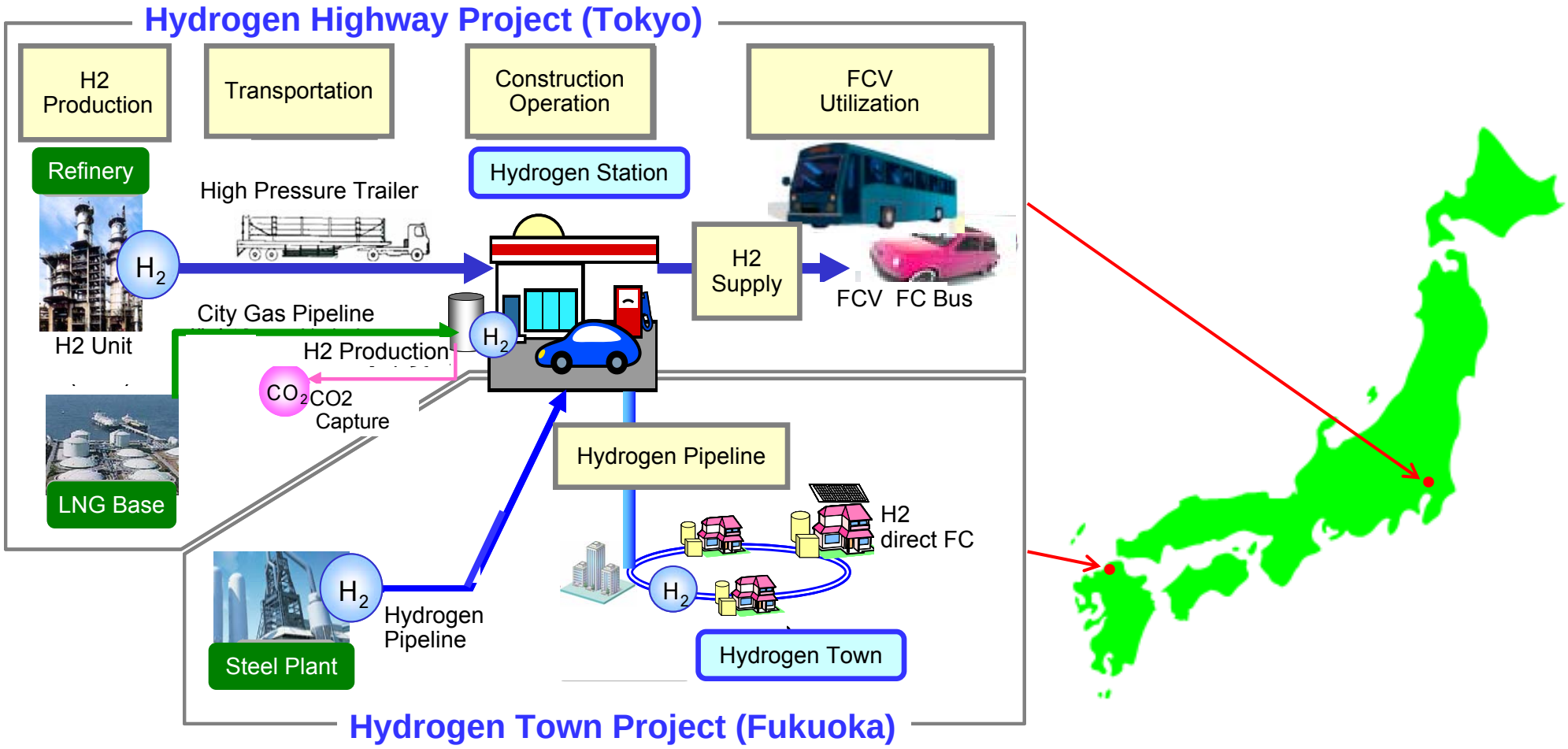


Outline of HySUT's Demonstration Program　2009 ~ 2010

< 2009 ~ 2010 >

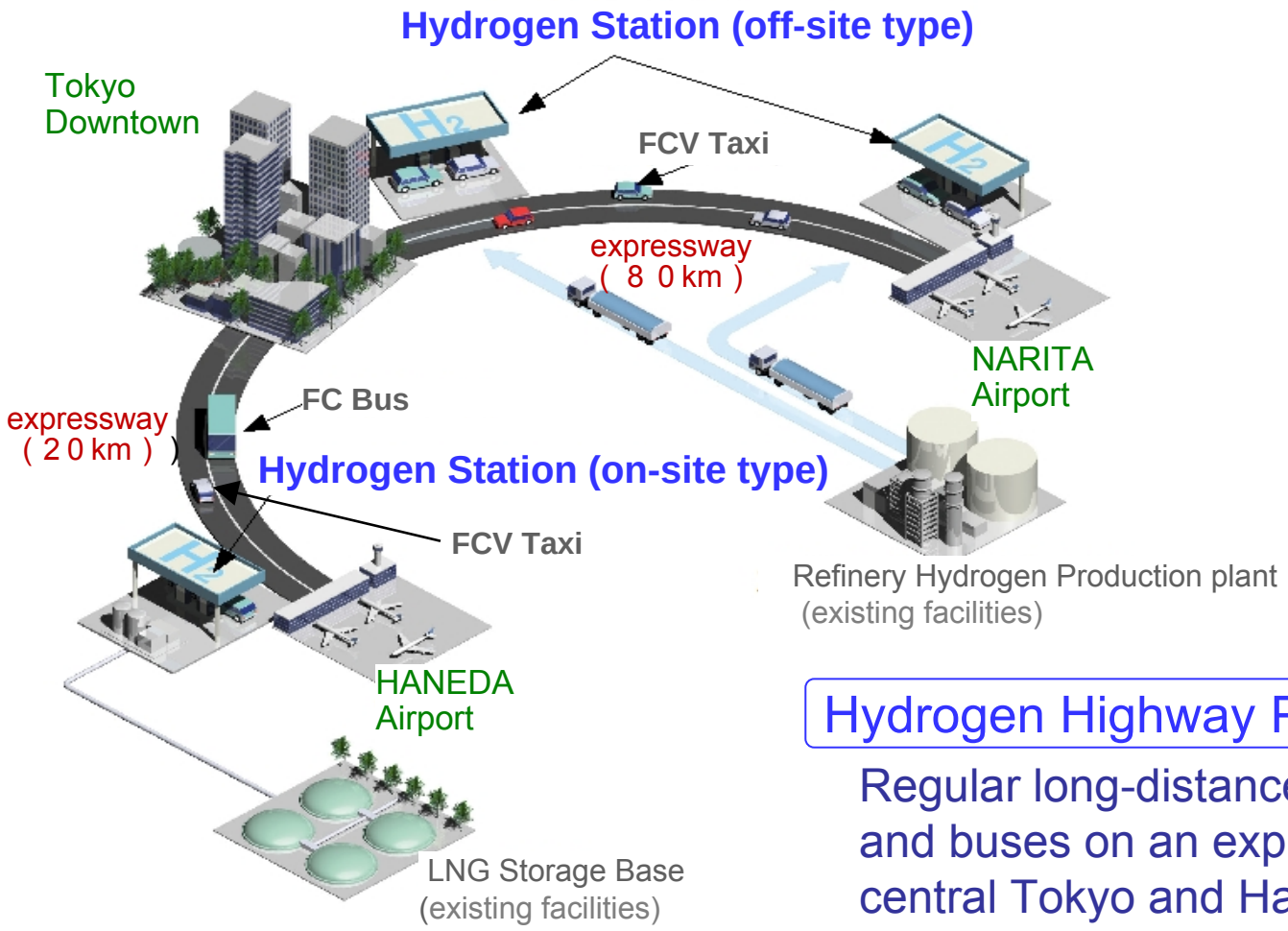
Tokyo and Fukuoka

METI : "Demonstration Program for Establishing a Hydrogen-Based Social System"



Outline of 2009-2010 Hydrogen Highway Project

METI : “Demonstration Program for Establishing a Hydrogen-Based Social System”



Hydrogen Highway Project (Tokyo)

Regular long-distance service of FCV and buses on an expressway connecting central Tokyo and Haneda/Narita Airport

Hydrogen Stations Central Control System （ Plan ）

Refinery (Hydrogen Production Plant)

Order by Phone

Central Office (HySUT)

Control Every Stations
- Inventory control of each Stations
- Refueling data of each stations
- Operation control of each stations

Car Operation Companies

Car Control
- Hydrogen usage Table for each cars

Station Control
- Inventory Control
- Refueling data Control
- Operation Control

Information to General Public
- Operating day and hours
- Refueling Capacity

Station Control
- Inventory Control
- Production Control
- Operation Control

City Gas Base

Narita Station

Central City Station

Haneda Station

HySut

Internet

Hydrogen Producing Device

Hydrogen Purifying Device

FCV

Limousine Service

Station Information (Browse)
- Operation
- Refueling Capability

FCV-BUS

Daily Service

Outline of 2009-2010 Hydrogen Town Project

METI : “Demonstration Program for Establishing a Hydrogen-Based Social System”

Hydrogen Town Project (Fukuoka)

Hydrogen supply to households through about 2km-long city gas pipelines

1. Outline and Background of establishment of HySUT

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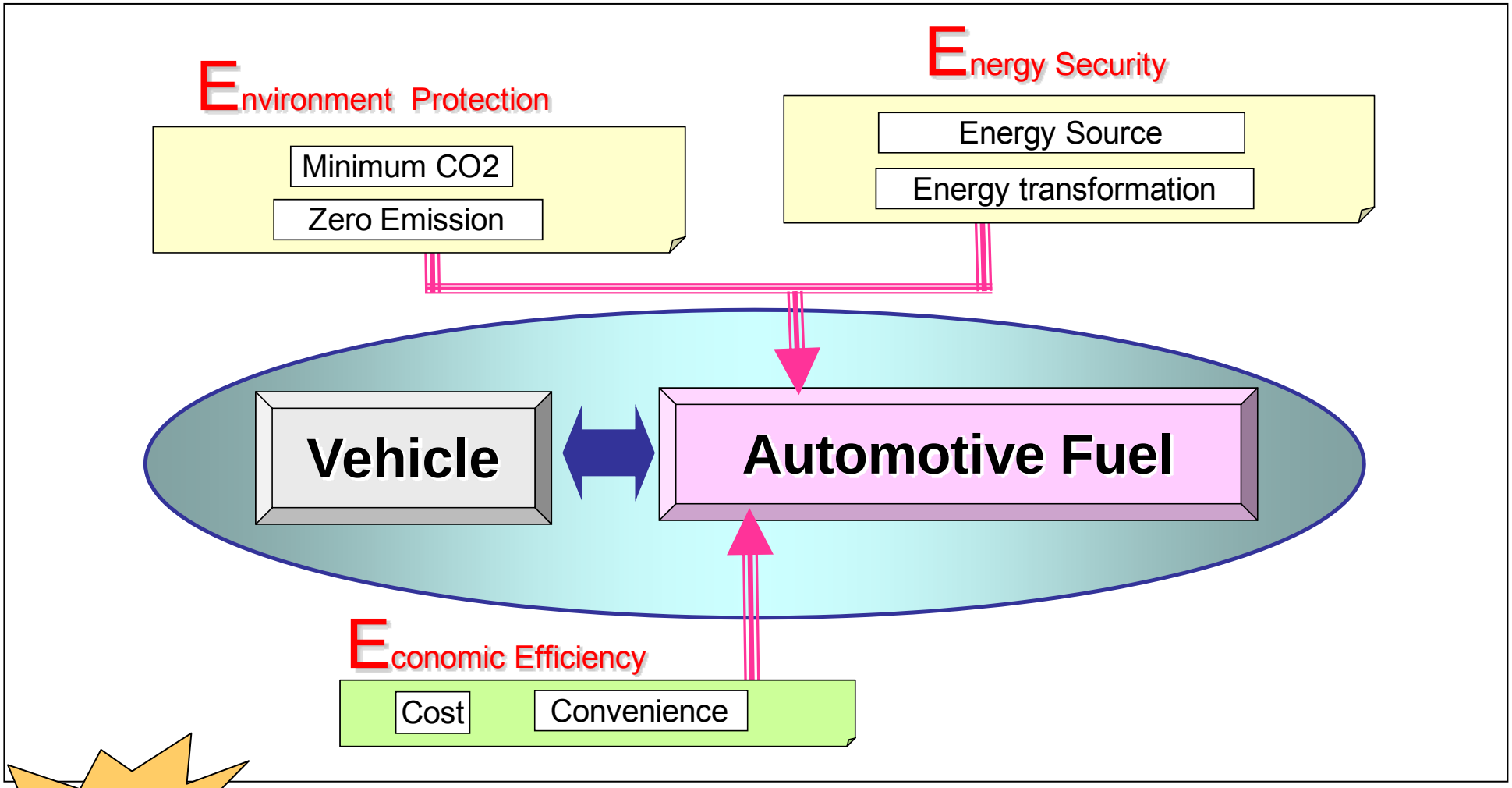
3E Requirements of Automotive Fuels



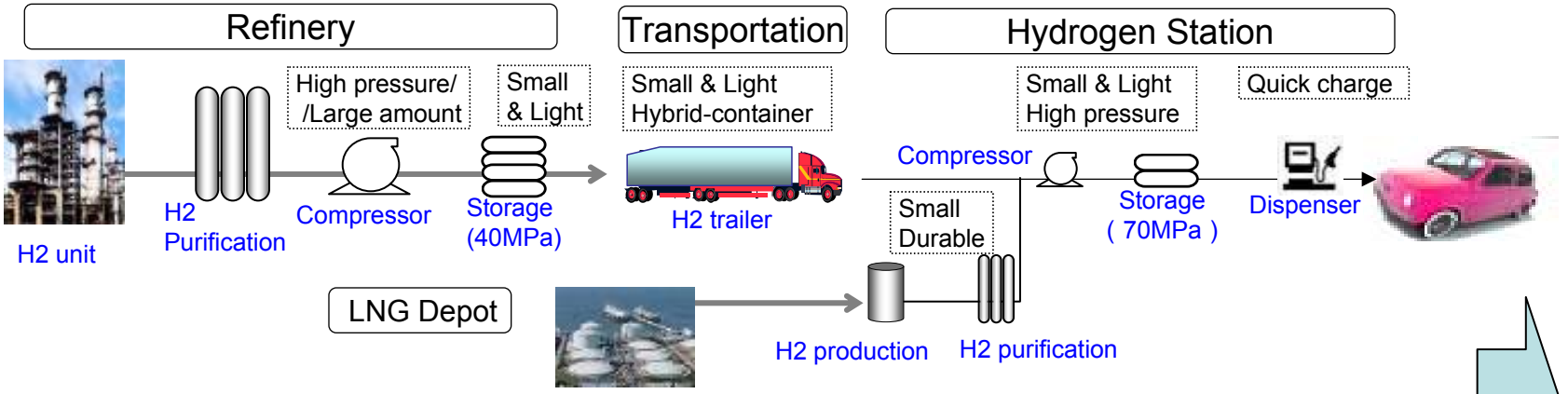
Important Problem

Urban Air Pollution	Energy Resources	Global Environment
(Emission Control)	(Stable & Sustainable Supply)	(CO2 Reduction)

Cost-down through R/D and Regulation relaxation

1 . R/D cost-down

NEDO project etc : Fundamental/Elemental R/D



・ Field test of total supply system

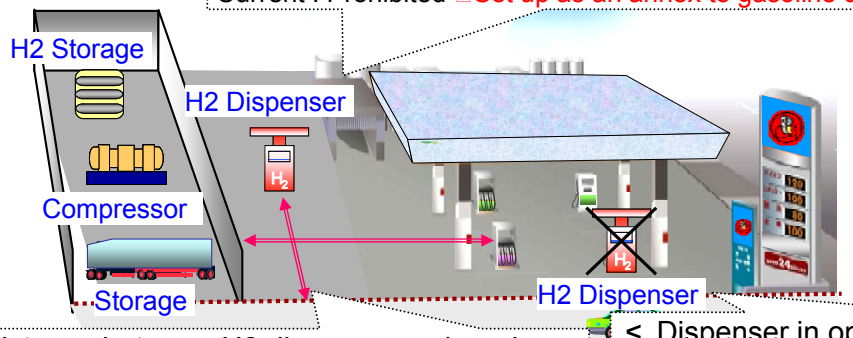
Target : Below gasoline price per driving distance

2 . Regulation relaxation cost-down

< Example >

<Storage capacity limit>
Building Standards Law
Current:
Semi-factory area : 3,500Nm^3
(100FCV charge capa.)
Shop/Sales area : 700Nm^3
(20FCV charge capa.)
Semi-residence area : 350Nm^3
(10FCV charge capa.)
□Raising shop/sales area limit to the same as semi-factory area limit

< High pressure equipment in open space for refueling >
Fire Service Law
Current : Prohibited □Set up as an annex to gasoline dispenser



< Distance between H2 dispenser and road >
High Pressure Gas Safety Act
Current : 6m □ 4m, same as gasoline dispenser

< Dispenser in open space for refueling >
Fire Service Law
Current : Prohibited □Set up as an annex to gasoline dispenser

Missions of “Next Stage Demonstration” toward Deployment

R/D

Data for regulation revision

Fundamental research for cost down

Next Stage Demostration

FCV utilization by individual consumers

Verification of CO2 reduction

Best station layout, Verification of user convenience

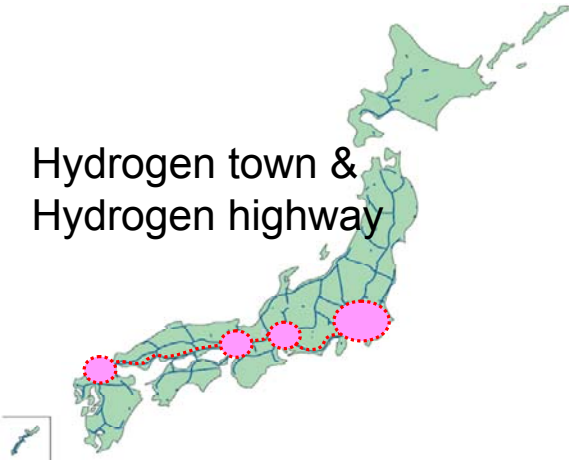
Construction and operation of hydrogen station

Field data accumulation for regulation revision and cost-down technology application

Establishment of consumer/social acceptance

Verification of hydrogen supply business

Planning of station arrangement



Hydrogen town & Hydrogen highway

Social system preparation

Revision of regulation

Revision of law

Deployment enhancement system Incentive, Mitigation

Required point of view on Social Demonstration Test

Social Point of View (Social acceptance)

How the Hydrogen energy system is safe and reassured, and contribute to CO2 reduction

User's Point of View (User's convenience)

Verify user's convenience of hydrogen supply network (Hydrogen Stations)

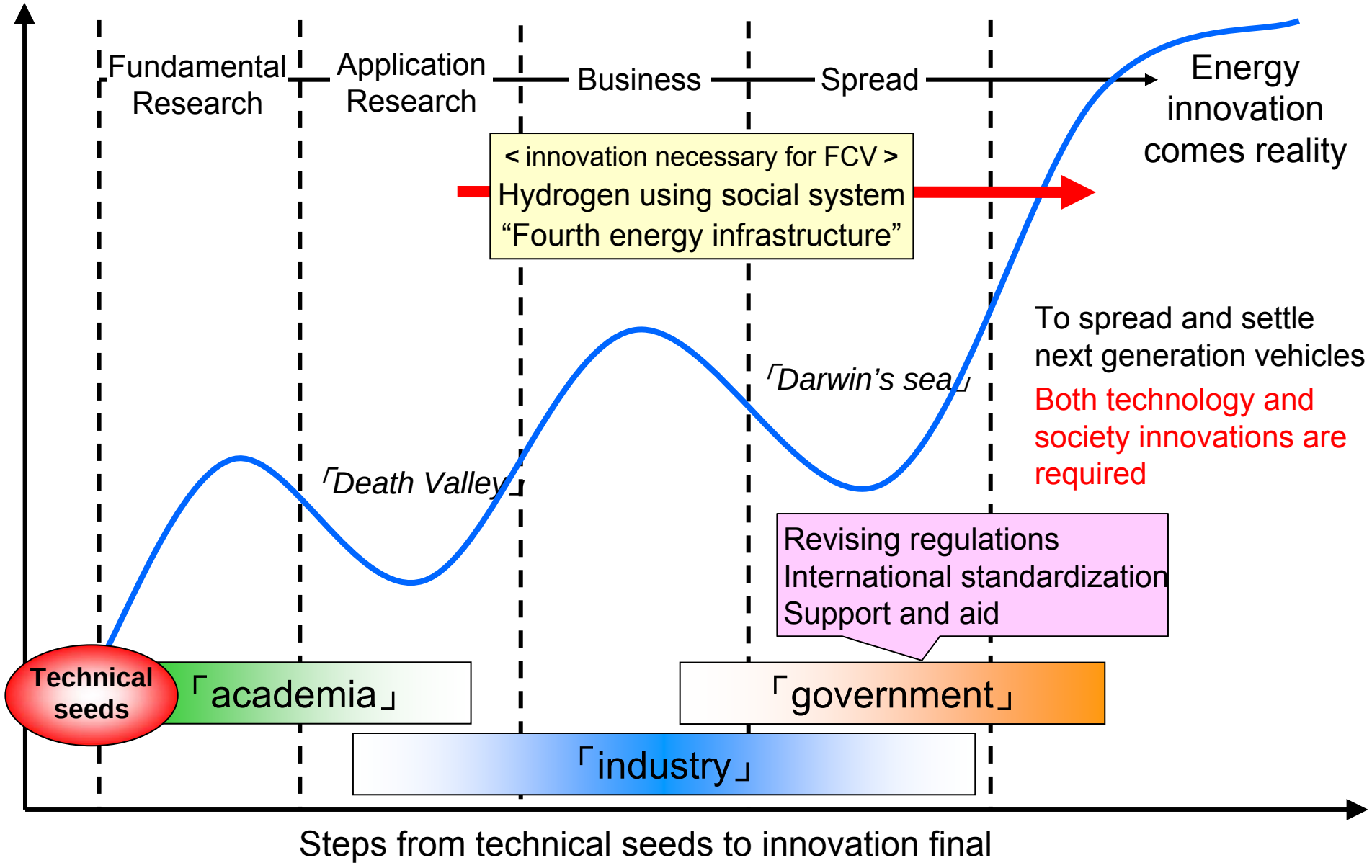
"Locating Hydrogen Stations without losing user's convenience" "Enabling the hydrogen cost Lower than gasoline equivalence"

Supplier's Point of View (Business Feasibility)

Verify the feasibility of hydrogen supplying business (Production, Transportation and Hydrogen stations)

"Enabling the competitive price for gasoline"

Innovation steps and FCV



Thank you for your attention.