



6th International Workshop on Hydrogen Infrastructure and Transportation 11-12 Sep 2018 Country update : Japan

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Today's topics

1. Strategy for H₂ & FC in Japan
2. Current Status : FCV & HRS
3. Budget for Hydrogen and Fuel Cells
4. Current Topics of NEDO's Program

1. Strategy for H₂ & FC in Japan



CABINET

Basic Hydrogen
Strategy

Scenario
for Strategy

METI

Strategic Roadmap

NEDO

R&D



New Energy and Industrial Technology
Development Organization



National Organisation Hydrogen and Fuel Cell Technology



Energy Efficiency &
Renewable Energy
FUEL CELL TECHNOLOGIES OFFICE

1. Strategy for H₂ & FC in Japan

“Basic Hydrogen Strategy”

➤ 2050 Vision:

Position H₂ as a new energy option
(following Renewables)

➤ Target:

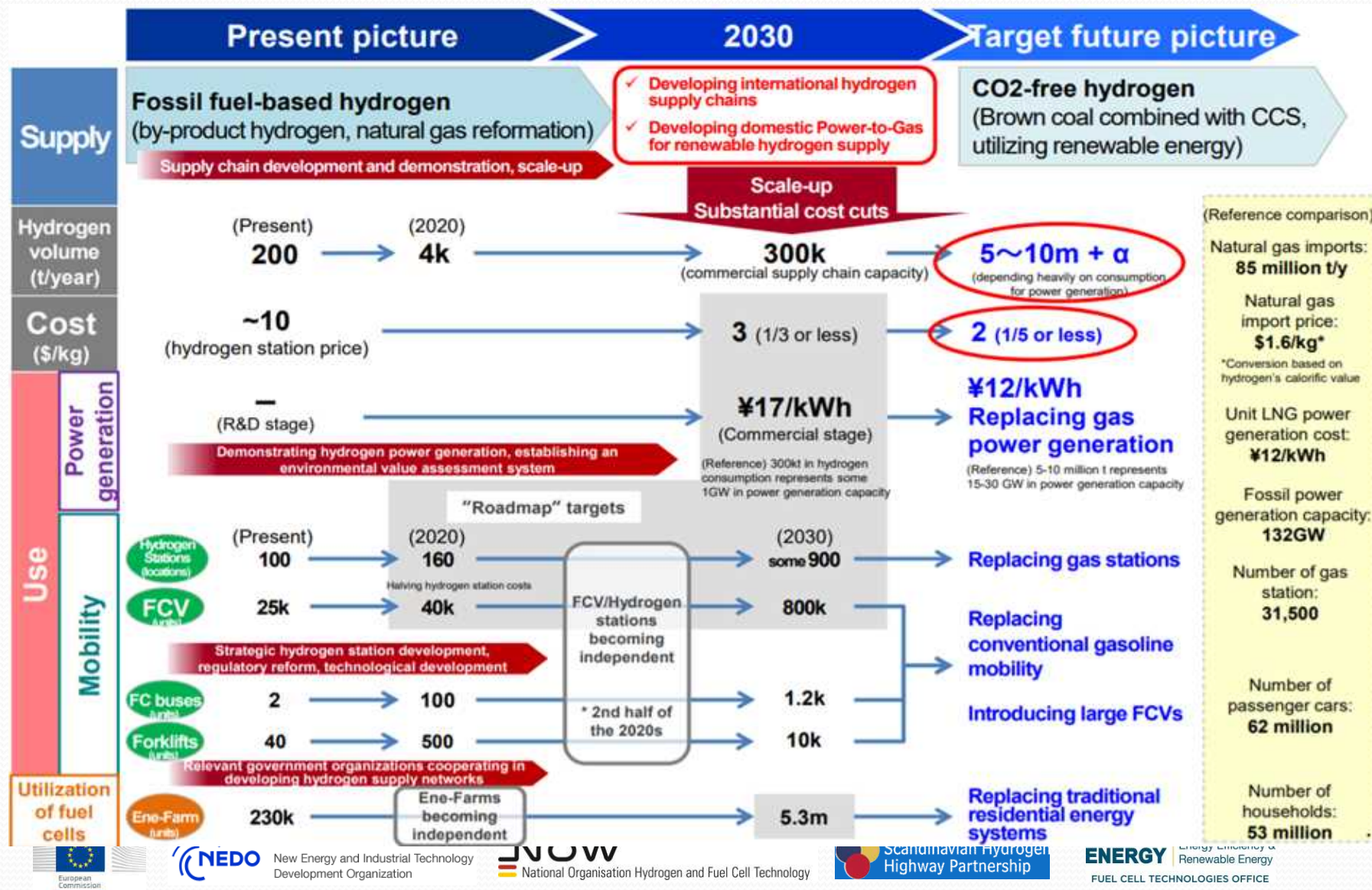
H₂ Volume: 300k t/y by 2030 ⇒ 5~10m t/y

H₂ Cost : \$3/kg by 2030 ⇒ \$2/kg

http://www.meti.go.jp/english/press/2017/1226_003.html

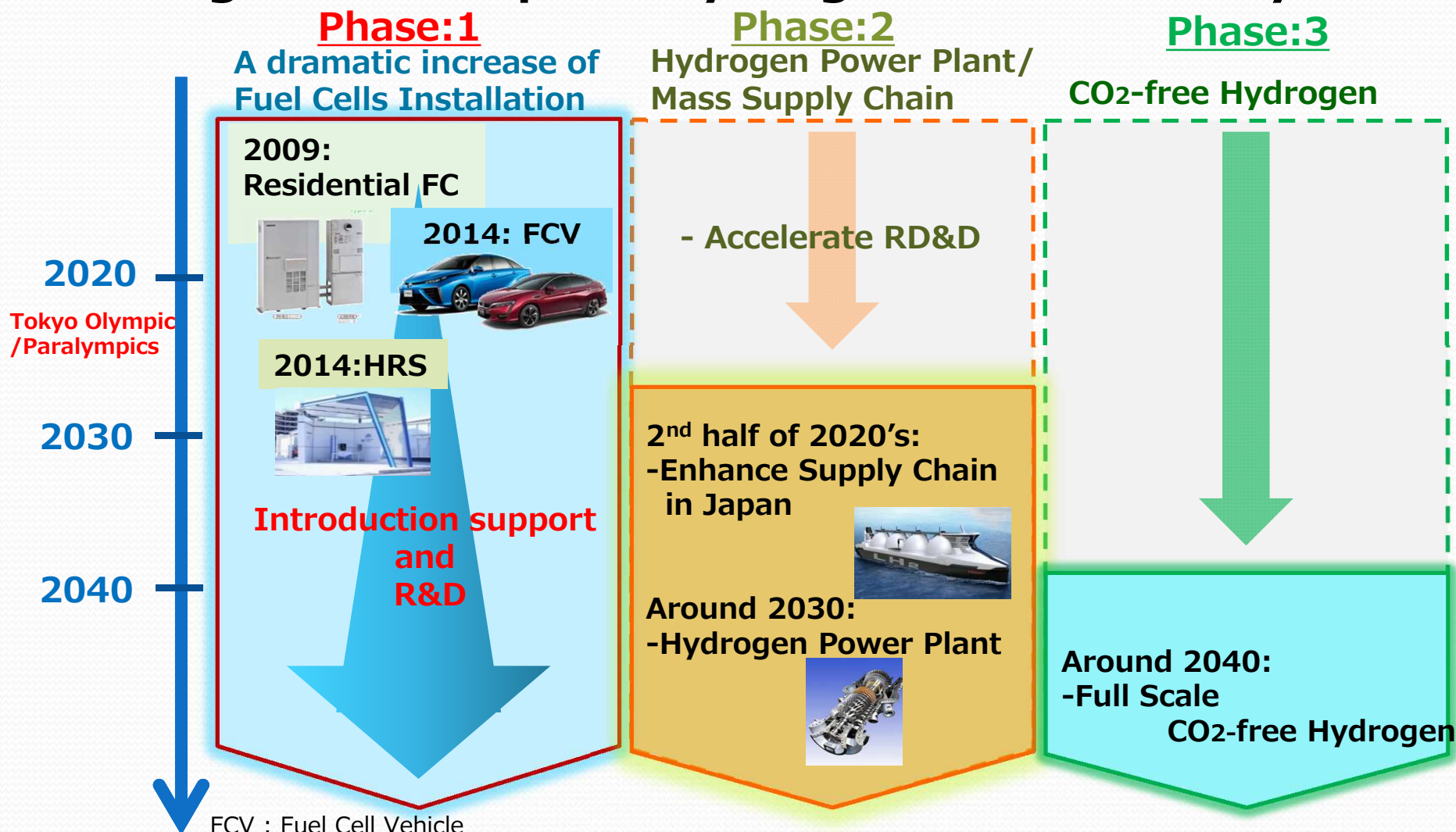
1. Strategy for H₂ & FC in Japan

“Scenario for Basic Hydrogen Strategy”



1. Strategy for H₂ & FC in Japan

"Strategic Roadmap for Hydrogen & Fuel Cell by METI"



FCV : Fuel Cell Vehicle
HRS : Hydrogen Refueling Station

2. Current Status : Fuel Cell application



Residential Fuel Cells

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

Marketed in 2009...



Around 250,000 units

FCV & HRS

Targets

FCV

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

HRS

- 160 by FY2020
- 320 by FY2025



**2,500
FCVs
deployed**

**100 Stations
Opened**
(11 planned)



2. Current Status : FCV & HRS

FCV: 2,500 on road

HRS: 100 in operation + 11 planned



**150t-H₂
in 2017**



Kinki Area

Total	In Operation				Planned
	Sub Total	On Site	Off Site	Mobile	
14	12	7	3	2	2

Chugoku / Shikoku Area

Total	In Operation				Planned
	Sub Total	On Site	Off Site	Mobile	
8	8	2	0	6	0

Kyushu Area

Total	In Operation				Planned
	Sub Total	On Site	Off Site	Mobile	
11	11	5	4	2	0

Hokkaido / Tohoku Area

Total	In Operation				Planned
	Sub Total	On Site	Off Site	Mobile	
6	4	1	0	3	2

Greater Tokyo Area

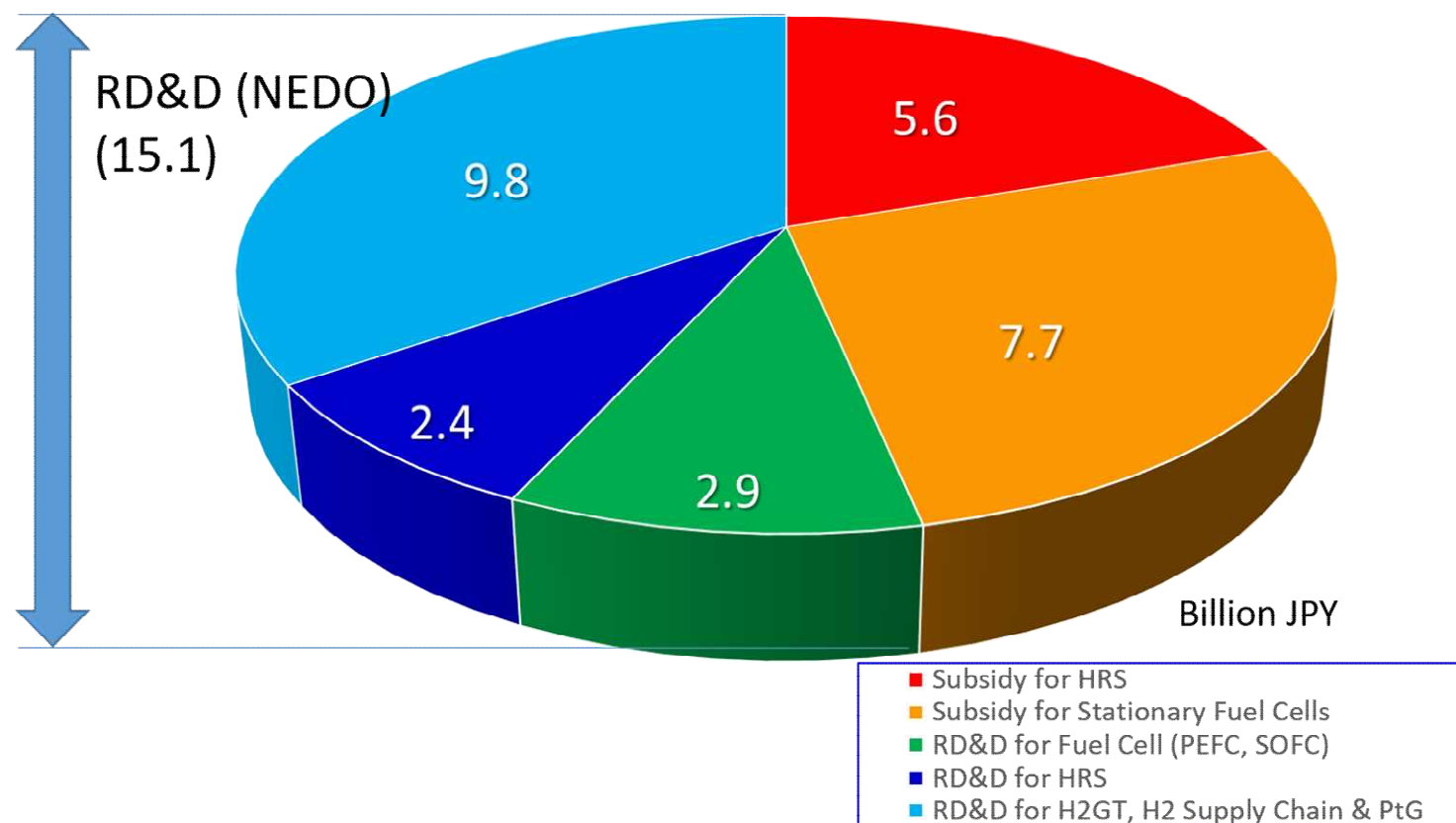
Total	In Operation				Planned
	Sub Total	On Site	Off Site	Mobile	
43	40	24	1	15	3

Chukyo Area

Total	In Operation				Planned
	Sub Total	On Site	Off Site	Mobile	
29	25	8	6	11	4

● Initial installation
in 4-major-populated areas

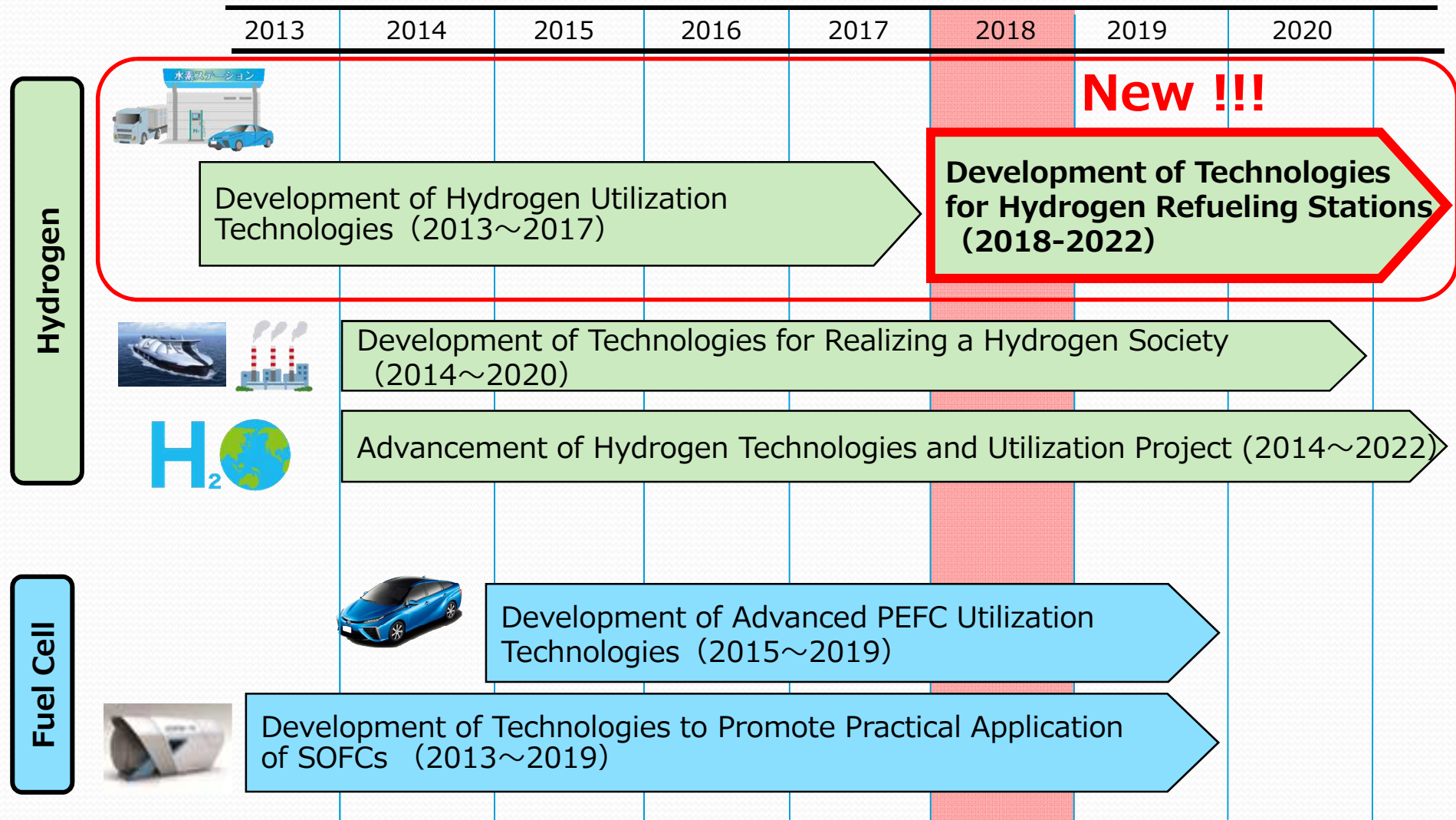
3. Budget for Hydrogen and Fuel Cells in FY 2018



METI's Total: 28.4 billion JPY (260 million US\$)

Not including subsidy for FCV

4.Current Topics of NEDO's Program



4. Current Topics of NEDO's Program

New Project of "Development of Technologies for HRS"

To make HRS independent by the 2nd half of 2020s,
R&Ds are as follow;

- ① To address Regulatory reform on HRS/FCV
 - To operate unmanned HRS(self-HRS) with remote monitoring
 - To perform Risk Assessment on HRS
 - To expand the scope of steel types, such as Stainless Steel
- ② Cost Reduction for both Operating and Installation Cost
- ③ International Collaboration
 - To promote technological development for International Standarization etc. (ISO、HFCV-GTR···)
 - To cooperate with relevant organizations

4. Current Topics of NEDO's Program

② Cost reduction of HRS

Aim to reduce

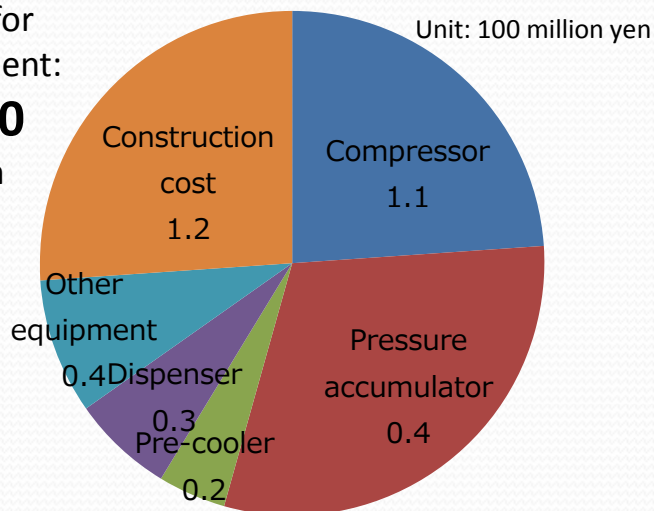
- ① Installation cost to 230 million yen by around 2020.
- ② Annual operating cost to closer to 20 million yen level.
(except for depreciation expense)

(as of the end of 2015)

Breakdown of costs for installation

Total cost for establishment:

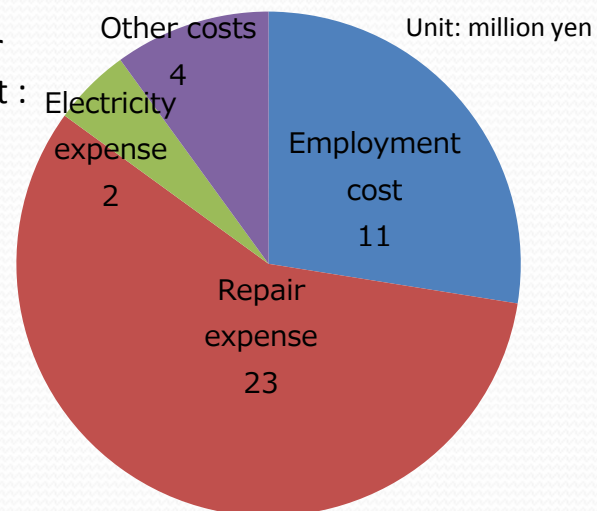
About **360** million yen



Breakdown of operating cost

Total cost for management :

About **40** million yen



* Average amount of grant money applied (as of FY 2015) (fixed off site 300N m3/h)

* Meanwhile, please note various facility expenses that are not covered by the support will be needed in addition to the above.

[Source] Created by the Agency for Natural Resources and Energy based on amount of grant money applied for projects for installation of hydrogen supply facility and reported amount of actual benefit.

4. Current Topics of NEDO's Program

② Cost Reduction for both Operating and Installation Cost(continued)

To achieve the target,

- Development of Polymer materials for Gas seals and Dispensing Hoses
- Development of life-extension method of Ground storage pressure vessels
- Development of refueling method for reducing cost (Possibility of higher temperature etc)
- Development of new type compressor, such as Electro-chemical compressor

etc

4. Current Topics of NEDO's Program - Others

◆ Hydrogen Supply Chain / Gas Turbine:

- Developing combustor for Hydrogen Gas Turbine (continued)
Dual fuel (NG & H₂)、 100% H₂ fuel
Several hundred MW , Several MW
- Developing hydrogen supply chain (continued)
Liquefied Hydrogen 、 MCH

◆ Power to Gas:

- PtG with 10MW class electrolysis (continued)
@ Fukushima Prefecture: Distribute H₂ to Tokyo 2020 Games
- Basic research for electrolysis (NEW project)
Analyzing reaction mechanism, develop lifetime evaluation,
(Alkaline, PEM, SOEC)

Current Topics (Demonstration)



Hydrogen gas turbine demonstration project



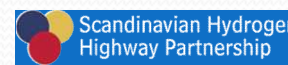
1MW dual fuel Gas
Turbine(LNG & H₂)
Provide Heat and Power



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Current Topics (Demonstration)



New “Power to Gas” : start construction in July 2018

@ Fukushima Pref.

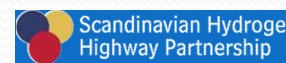
With 10MW electrolysis / provide H₂ to Tokyo 2020



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Thank you for your kind attention!

