

Hydrogen Production Activities in Japan

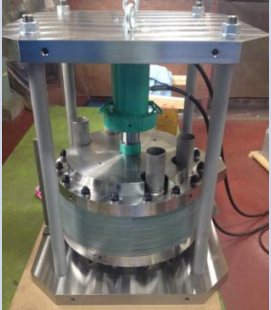



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Development Organization(NEDO)

CONTENTS

1. **NEDO's activities** in hydrogen production
2. **Roadmap** on hydrogen production in Japan
3. **Market applications** for PEM electrolyzer in
Japan
4. **Cost targets** for electrolysis and hydrogen
production costs

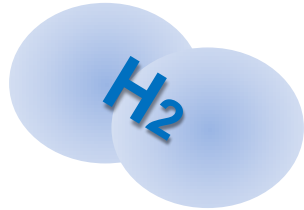
1. NEDO's activities in hydrogen production

Activities	2013	2014	2015	2016	2017	2018
Hydrogen Production   			Alkaline type Asahi Kasei	MW Class 0.6A/cm ² 1.8V		
			Alkaline type Hitachi Zosen	MW Class 0.6A/cm ² 1.8V		
			SOEC type TOSHIBA	2kW 0.5A/cm ² 1.3V		
“Power to X” H ₂ for variable Renewable Energy integration				FS	PEM (Reversible Type) Takasago T.E. & AIST	
				FS	PEM TORAY	

2. Roadmap on hydrogen production in Japan

2.1 Strategic Road Map on Hydrogen and Fuel Cells

(METI, Agency for Natural Resources and Energy)



Phase 1 Expanding Fuel Cell

2009: Residential FC
2015: FCV
2017: Stationary FC

around 2020:
FCV fuel cost \leq HEV fuel cost

around 2025:
FCV cost competitive \geq HEV



Phase 2 H2 Power Plant/ Mass Supply Chain

-Accelerating development and demonstration
-Realizing Reasonable Hydrogen price



Mid 2020s
-H2 Cost (CIF) : JPY30/Nm3
-Enhance Supply Chain in Japan



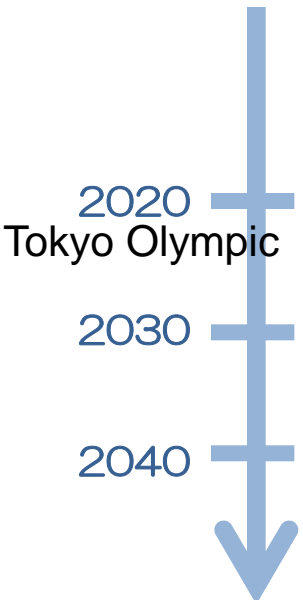
Around 2030
-Import H2 from overseas
- Full-scale H2 Power Plant

Phase 3 CO2-free Hydrogen

Systematic development and demonstration of such a system,

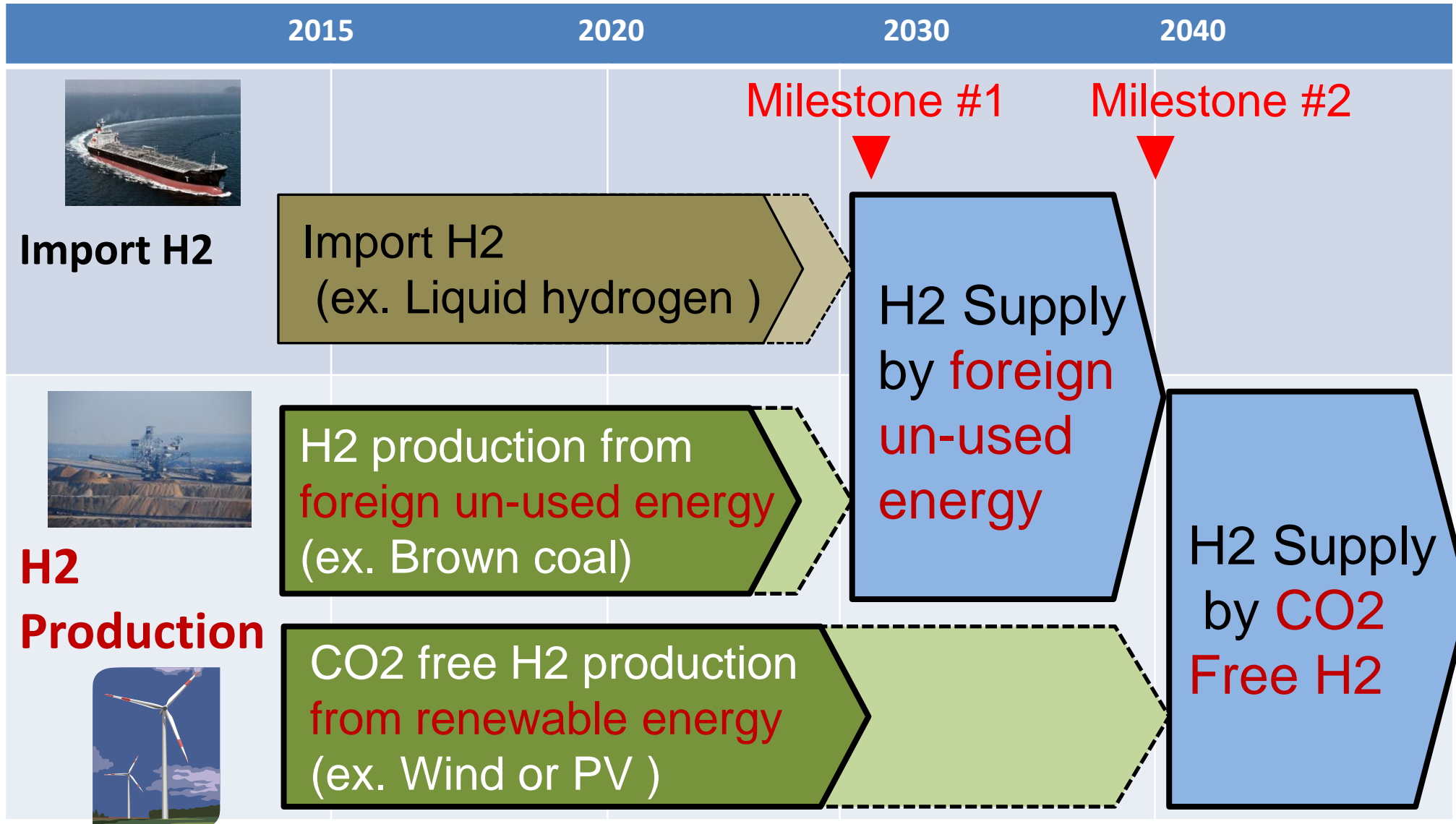



Around 2040
CO2-free H2 by combining CCS and renewable energy

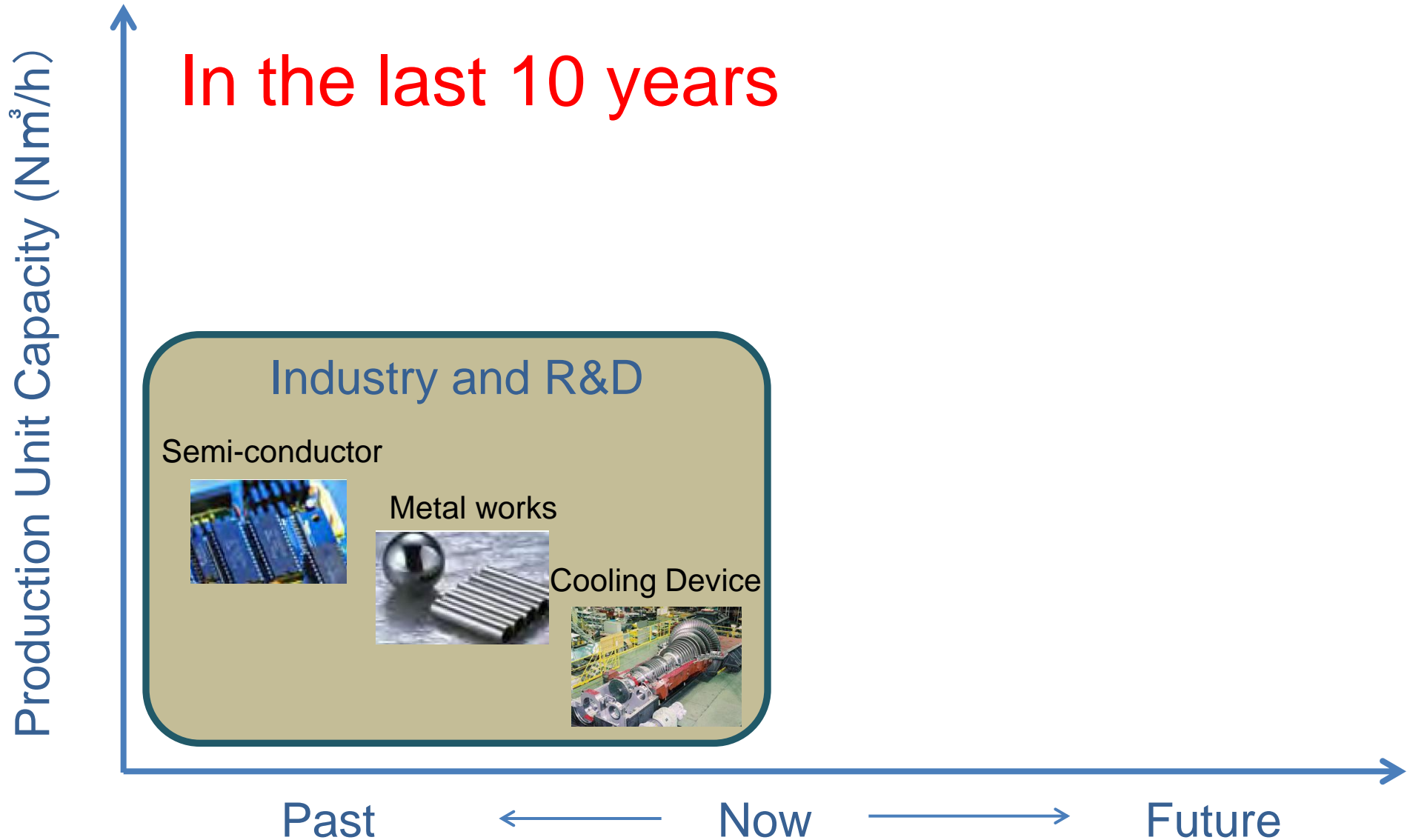


2. Roadmap on hydrogen production in Japan

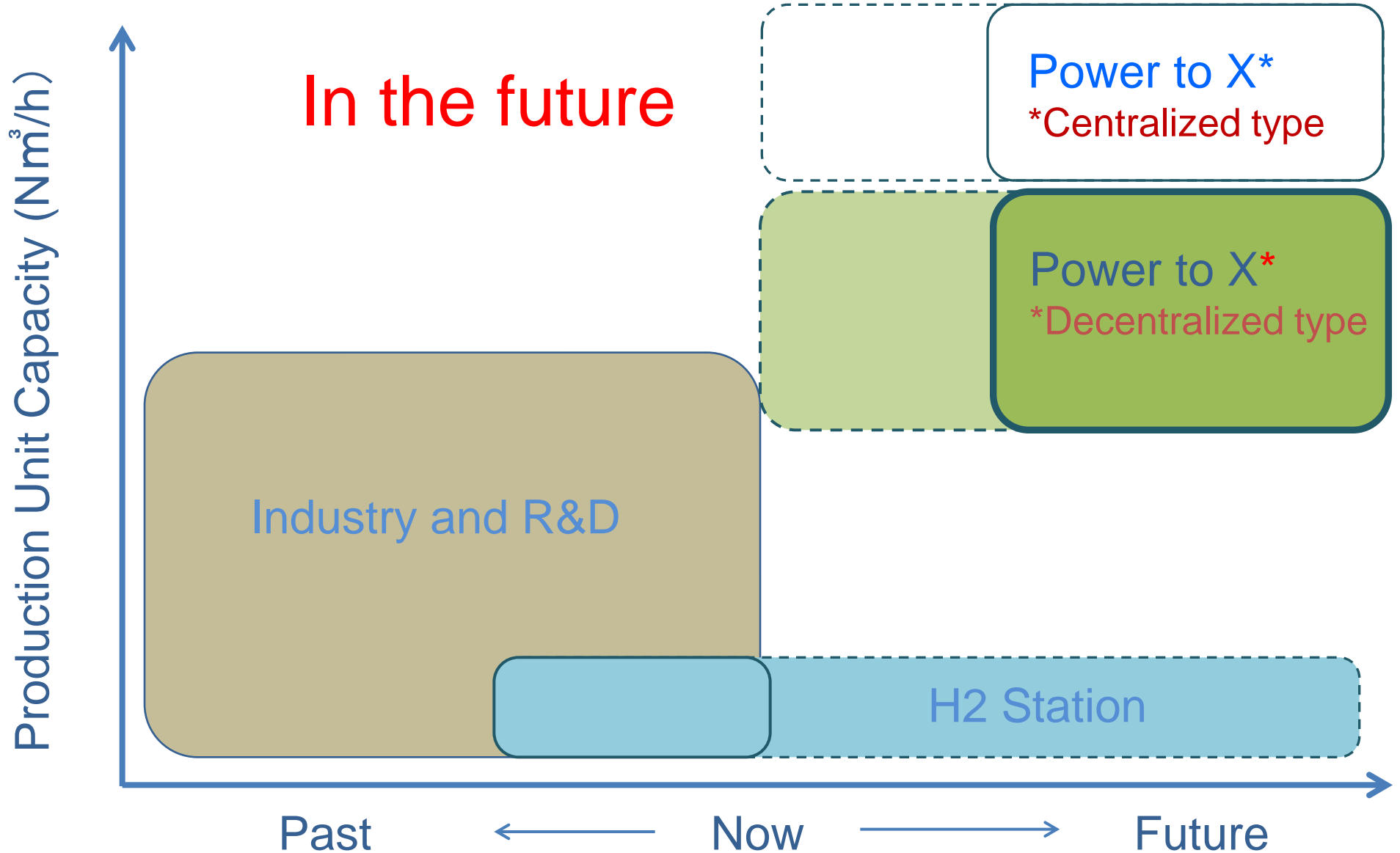
2.2 Roadmap on Hydrogen Production RD



3. Market applications for PEM electrolyzer in Japan



3. Market applications for PEM electrolyzer in Japan



4. **Cost targets** for electrolysis and hydrogen production costs

- Cost target for hydrogen production is JPY 30/Nm³, which is equivalent to USD 0.25/Nm³.
- Initial investment cost target for electrolysis is
JPY 200,000/Nm³/h
USD 1,700 /Nm³/h