

# The 11th NEDO-CDTI Joint Workshop

## “Technologies for Hydrogen Valley in Spain and Japan – Regional H2 Value Chain”

Hydrogen



水素が  
次世代エネルギー  
社会を切り拓く!

## Overall domestic hydrogen supply system

Toshifumi Kon

Group leader

Hydrogen Energy Advance department

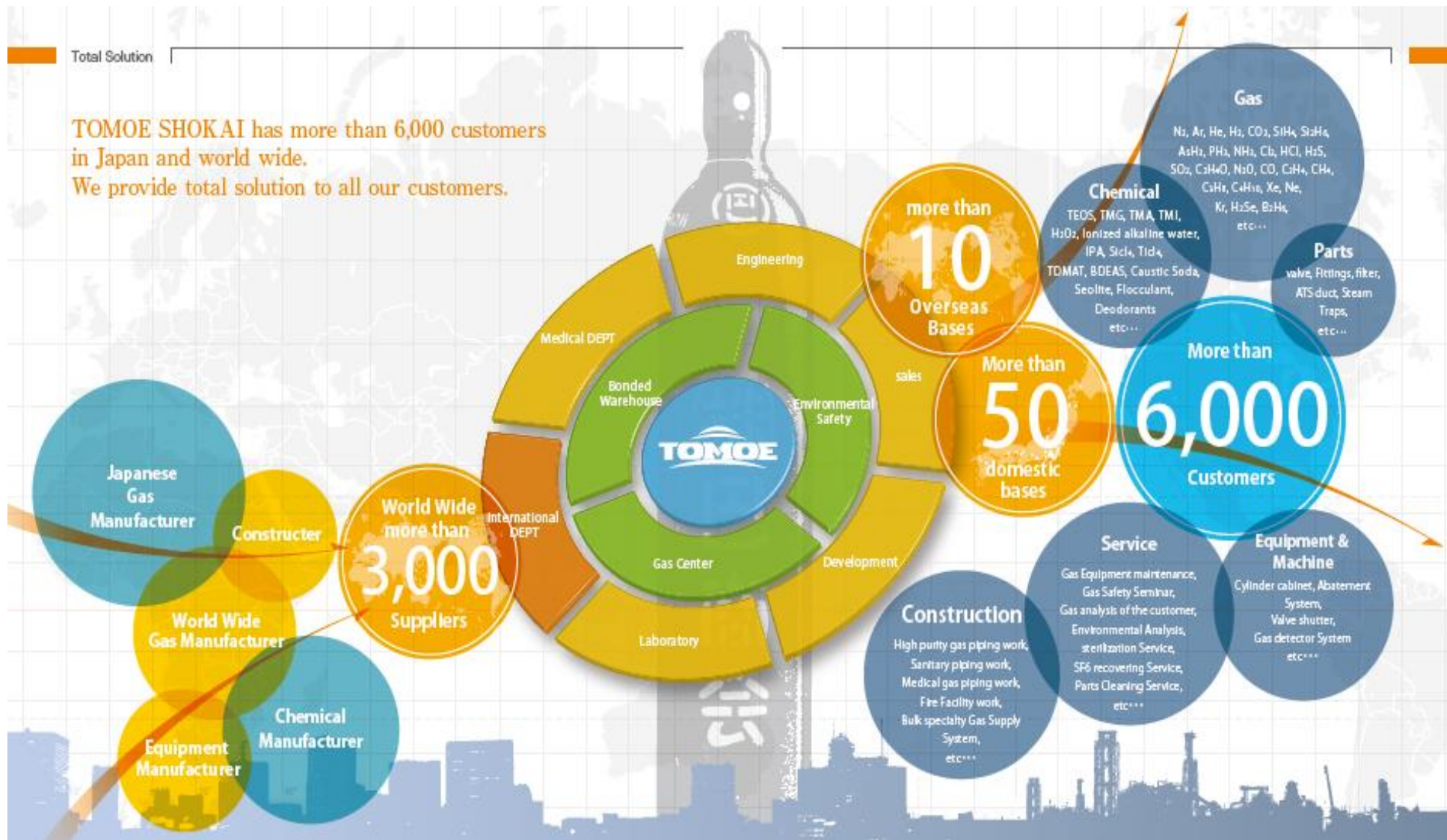




# Company

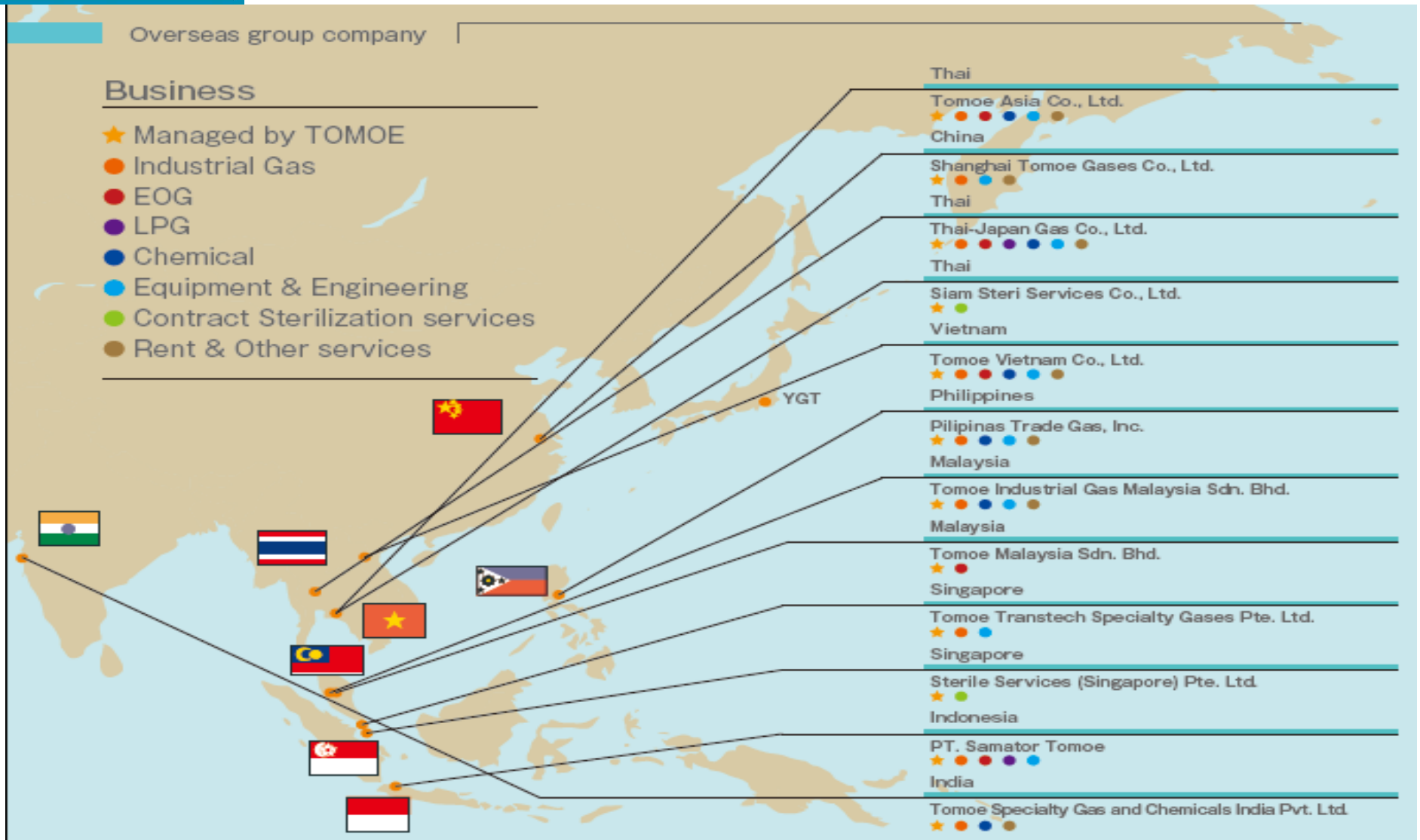
Total Solution

TOMOE SHOKAI has more than 6,000 customers in Japan and world wide.  
We provide total solution to all our customers.





# Overseas brunch company






# High Pressure Safety Act in Japan

High pressure → Risk

Pressure over 1 MPa at 35 °C for hydrogen

The High-Pressure Gas Safety Act regulates the categories of below.

- Manufacturing
  - Storage
  - Sale
  - Delivery
  - Consumption
  - Other handling
  - Container manufacturing
- 
- Amount
  - Pressure resistance
  - Security distance
  - Measurement
  - Material
  - Inspection
  - Qualification

- Purpose of the Safety Act -

**Ensuring public safety** by promoting voluntary activities related to high-pressure gas safety by private businesses and the High-Pressure Gas Safety Institute



# Storage

## The state of hydrogen storage

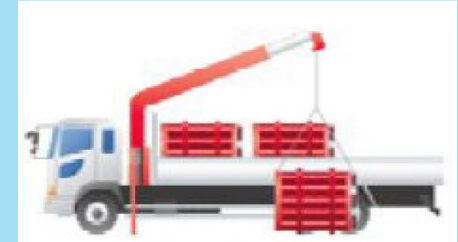
States	Storage	Advantages	Disadvantages
Compression	Pressure container	Existing technology Long term storage	High pressure
Liquid	Cryogenic	Mass transportation	Energy for liquefaction New cryogenic equipment (boiling point : -253°C) Boil off

# Delivery

Cylinder → Truck



Cylinder Cardle → Crane truck



## Delivery

Tube Trailer



Tank Lorry





# Consumption

## High pressure



## Decompression



## Utilization



### Hydrogen destination in Japan (2021 current)

- Semiconductor 27%
- Steel 25%
- Chemical 19%
- Glass 11%
- Others 18%



Near-future

Energy

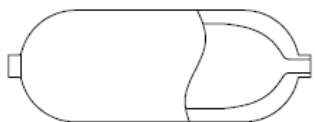
(Refer to 2022 Gas Georama in Japan)



# Storage and delivery for near-future

## High pressure container

Type1



Steel  
Heavy, long life

Type2



Steel+ FRP  
Medium weight

Type3



Al alloy + FRP  
Small weight

Type4



Plastic + CFRP  
Lightest

## Development of Type-4 container trailer (Supported by NEDO)



Current  
19.6MPa



Development  
45MPa

Double delivery capacity  
Many deliveries in one time

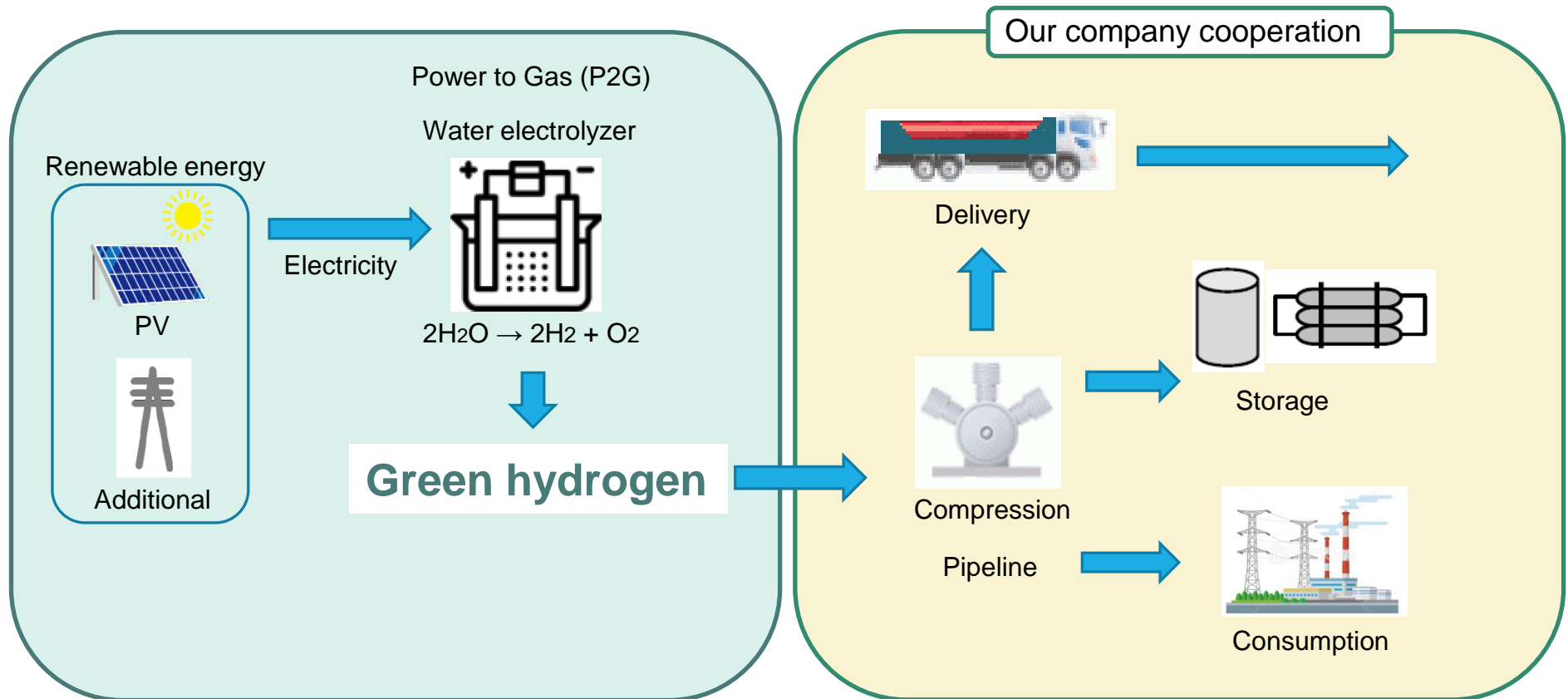
NEDO : New Energy and Industrial Technology Development Organization  
National research and development agency





# Green Hydrogen

## Green Hydrogen for decarbonization



## Decarbonization from hydrogen manufacturing



# Utilization

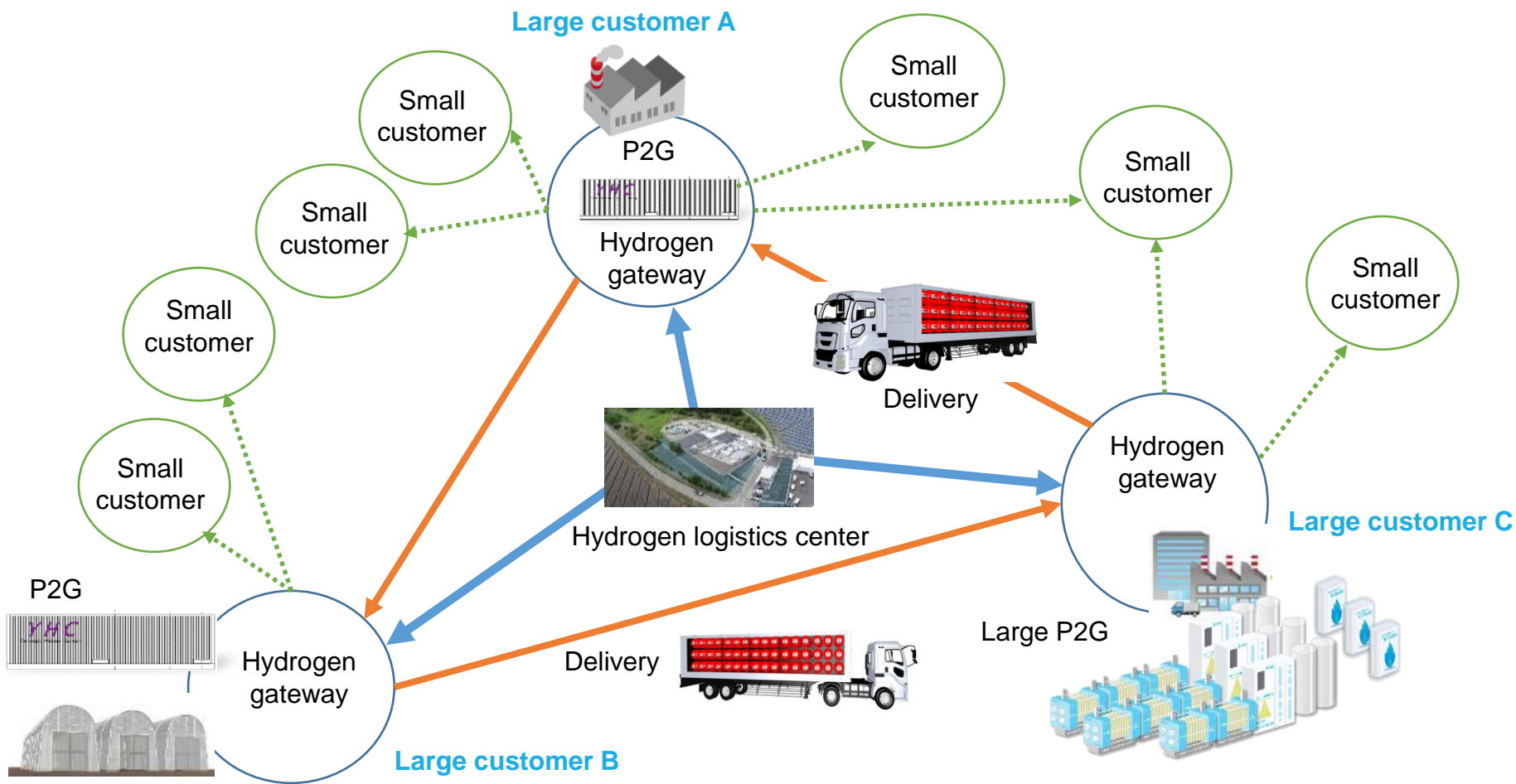
- Fuel conversion of fossil fuels
- Mobility
- Stationary fuel cell
- Gray hydrogen → Switch to green hydrogen





# The model of local production for local consumption

Economic region decarbonization (Supported by NEDO)

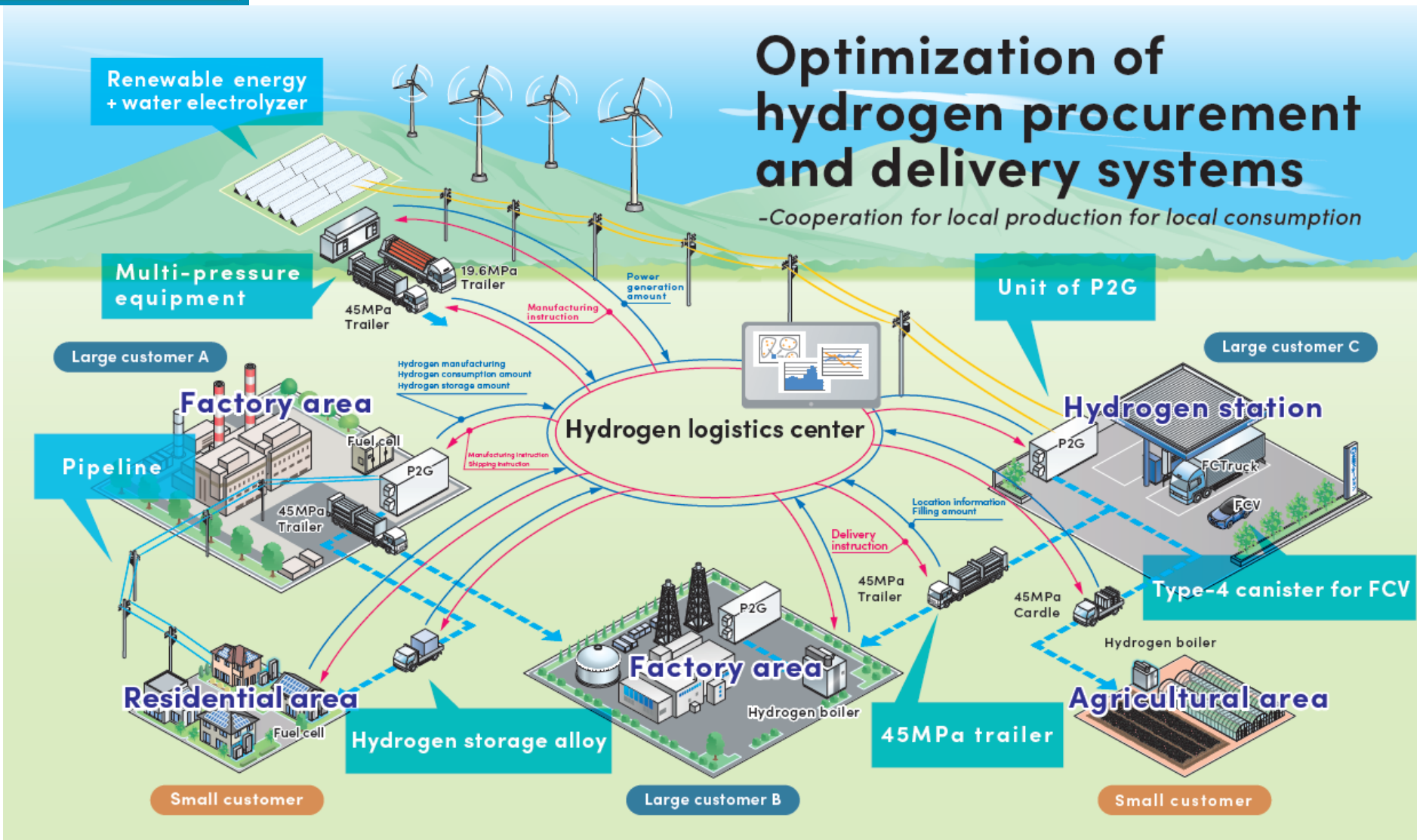




# Our vision

## Optimization of hydrogen procurement and delivery systems

-Cooperation for local production for local consumption





# Summary

- The High-Pressure Gas Safety Act in Japan
- Explanation from hydrogen manufacturing to consumption
- Development of various containers and delivery
- Local production for local consumption of Green Hydrogen

If there is anything we can cooperate for, please contact our company.

<http://www.tomoeshokai.co.jp/english/index.html>