



# **Asahi Kasei's Challenge**

## **— Working toward a hydrogen society —**

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Green Solution Project

**Asahi Kasei Corporation**

# Brief introduction of Asahi Kasei

- Diversified chemical company with three business sectors
- 44,497 employees over 15 countries, headed in Tokyo Japan
- Around ¥2,106 billion (USD 19.0B) net sales (2020) \*Exchange Rate: 1USD = 111JPY

Head Office	Chiyoda, Tokyo, Japan
Founding	1922
Employees	44,497 as of March 31, 2021
Fiscal 2020 result	Net sales: ¥ 2,106 billion (USD 19.0B) Operating income: ¥ 172 billion (USD 1.6B)



## Asahi Kasei Corp. [holding company function]

### Material



- Asahi Kasei Corp.  
[operating function]
- Asahi Kasei Microdevices Corp.

### Homes



- Asahi Kasei Homes Corp.
- Asahi Kasei Construction  
Materials Corp.

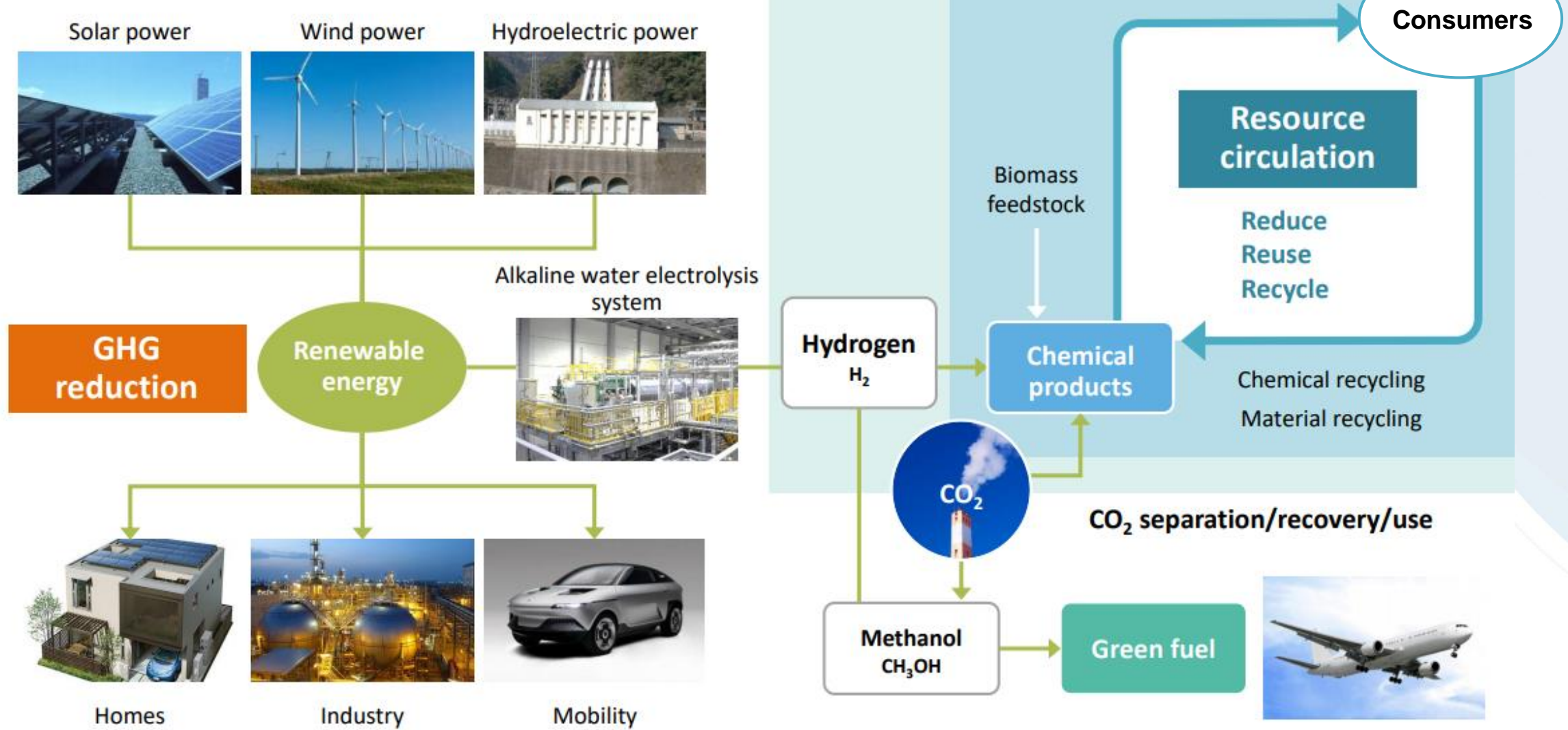
### Health Care



- Asahi Kasei Pharma Corp.
- Asahi Kasei Medical Co., Ltd.
- ZOLL Medical Corporation
- Veloxis Pharmaceuticals Inc.

# Concept for carbon neutral and sustainable world

To realize a sustainable society,  
the Asahi Kasei Group aims to achieve carbon neutrality by 2050



# Project for decarbonization

Working with other companies to achieve a hydrogen society, increasing our own use of renewable energy

## Green Solution Project (from April 2021)

- ▶ Aiming to create businesses that can provide value to society with an overview of the entire carbon neutral-related market

## Working toward a hydrogen society

- ▶ Contributing to the achievement of a hydrogen society through large-scale water electrolysis demonstrations, etc.
- ▶ Participation in Japan Hydrogen Association

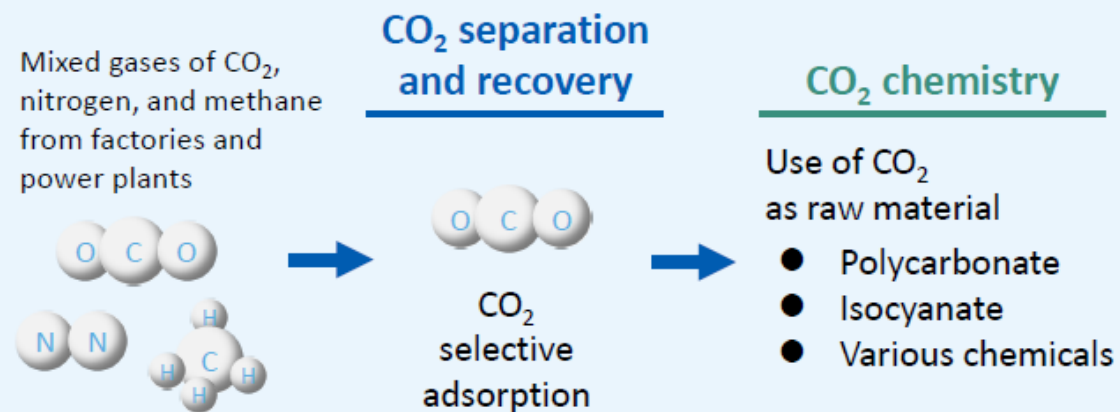


NEDO project  
Fukushima Hydrogen Energy Research Field (FH2R)



ALIGN-CCUS  
water electrolysis system  
(Niederaussem, Germany)

## Achieving CO<sub>2</sub> adsorption and utilization



- ▶ Developing a new zeolite-based CO<sub>2</sub> separation and recovery system
  - Significant improvement in CO<sub>2</sub> adsorption performance compared to conventional adsorbents



**1923**

- **Begins manufacturing hydrogen by water electrolysis** as raw material for ammonia in Nobeoka, founding place of Asahi Kasei



Casale's synthetic ammonia process monument  
(Certified chemical heritage)

**1975**

- Commercializes **Chlor-alkali electrolysis** by Ion exchange membrane. Asahi Kasei is the only company in the world that can provide electrolyzer, membrane and electrode. Ion-exchange membrane "Aciplex™" is No.1 share in WW.



Chlor-alkali electrolyzer  
"Acilyzer™"



**2010**

- **Begins R&D of Alkaline water electrolysis** based on Chlor-alkali electrolysis technology.

**2013**

- Contracts with NEDO on "Leading R&D business of hydrogen usage" project (~FY2019)

**2018**

- Sets up Alkaline water electrolysis for R&D in Souma (Fukushima) and Herten (Germany)



Souma IHI green energy center  
Alkaline water electrolysis system

**2020**

- Sets up **10MW large-scale alkaline water electrolysis** and operation begins as NEDO project "Fukushima hydrogen energy research field (FH2R)"
- Contracts with NEDO on "R&D of construction Hydrogen society technology" project (~FY2022)
- Sets up Alkaline water electrolysis in Niederraussem (Germany) for EU-fund "**ALIGN-CCUS**"

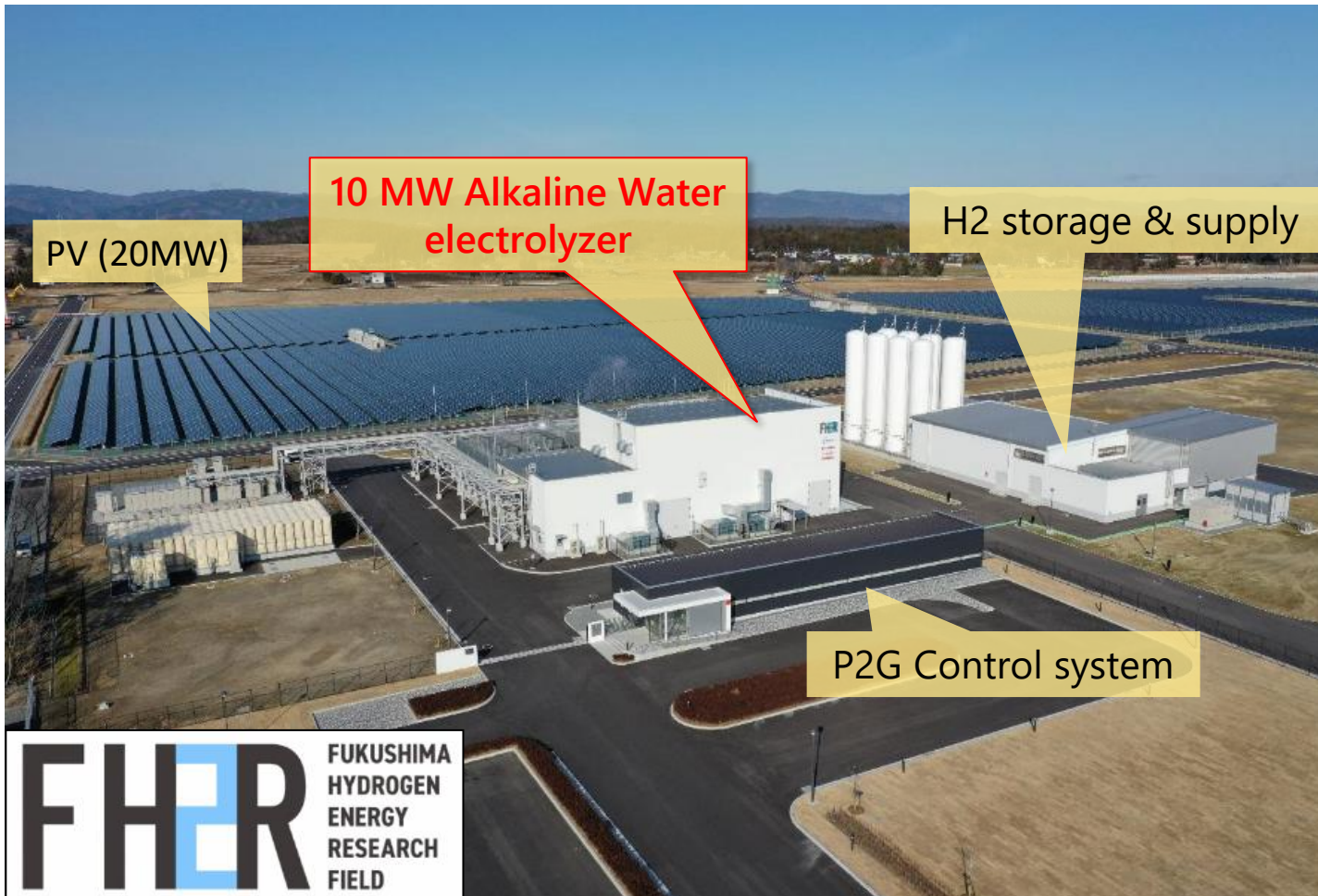


**ALIGN-CCUS**  
Water electrolysis system  
(Niederraussem, Germany)



**NEDO project in FH2R**  
(Fukushima)

# Fukushima Hydrogen Energy Research Field (FH2R)



Namie town  
in Fukushima

- National project\* in Japan
- Hydrogen production using electricity from solar panels
- 10MW electrolyser as a single unit
- Started operation in March 2020

\* FH2R is a project commissioned by the New Energy and Industrial Technology Development Organization (NEDO).



# FH2R 10MW Alkaline water electrolysis system



Max. H<sub>2</sub> supply : 2,000Nm<sup>3</sup>/h  
(World's largest size as one unit)  
Cell area : about 3m<sup>2</sup>/cell  
Number of cells : 170cells

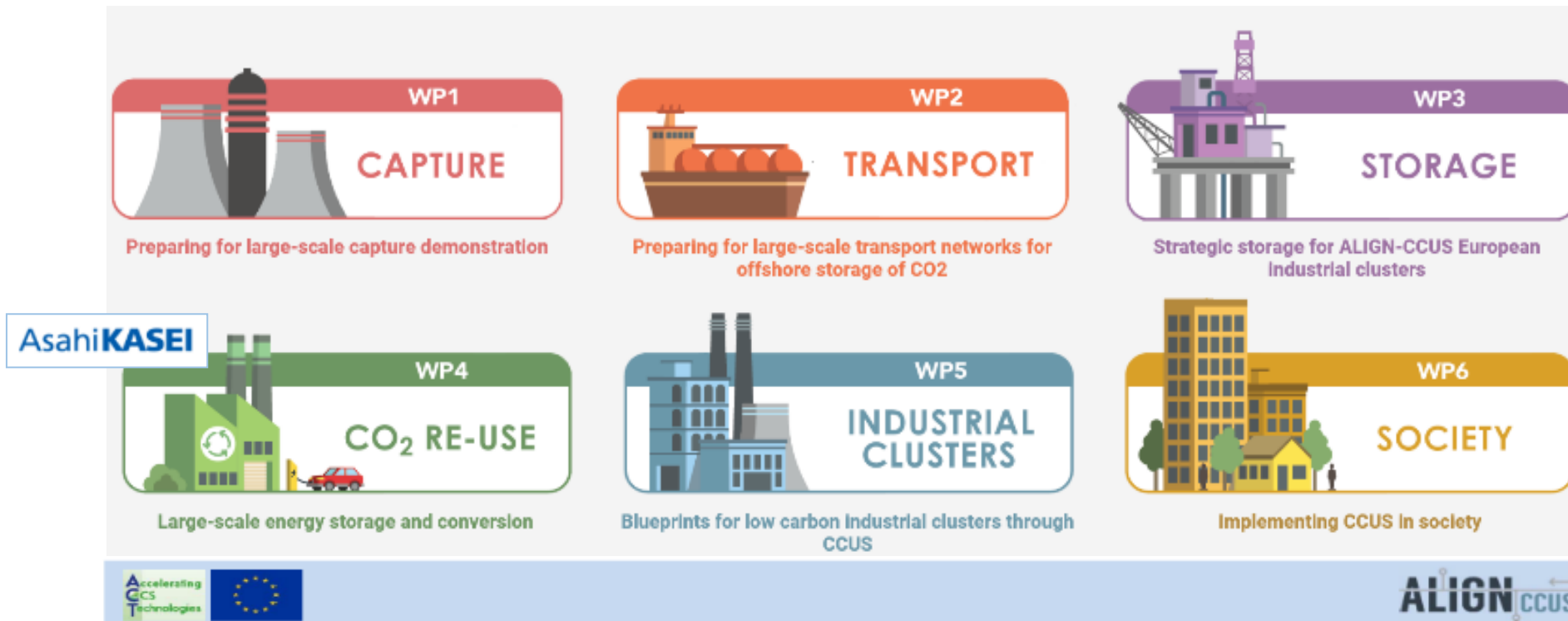
December 2017 : Started design works for the 10MW of water electrolysis system  
January 2019 : Started installation works at the site  
November 2019 : Produced Hydrogen gas  
March 2020 : Held opening ceremony at the site  
July 2020 : Delivered the water electrolysis system to the project

# ALIGN CCUS Project

- ALIGN CCUS Project on technologies for CCS and CO<sub>2</sub> utilization
- R&D project which consists of six Work Packages
- Asahi Kasei joined in WP4

\*ACT: Accelerating CCS technologies, funding program under Horizon2020.

\*ALIGN: Accelerating Low CarboN Industrial Growth through-CCUS Project





# ALIGN CCUS Project Working Package 4

RWE  
The energy to lead



Capturing capability:  
300kg/hour



RWE  
The energy to lead

AsahiKASEI

ECN  
Your energy. Our passion.

JÜLICH  
FORSCHUNGSZENTRUM

BOSCH  
Technik fürs Leben

TNO  
innovation for life

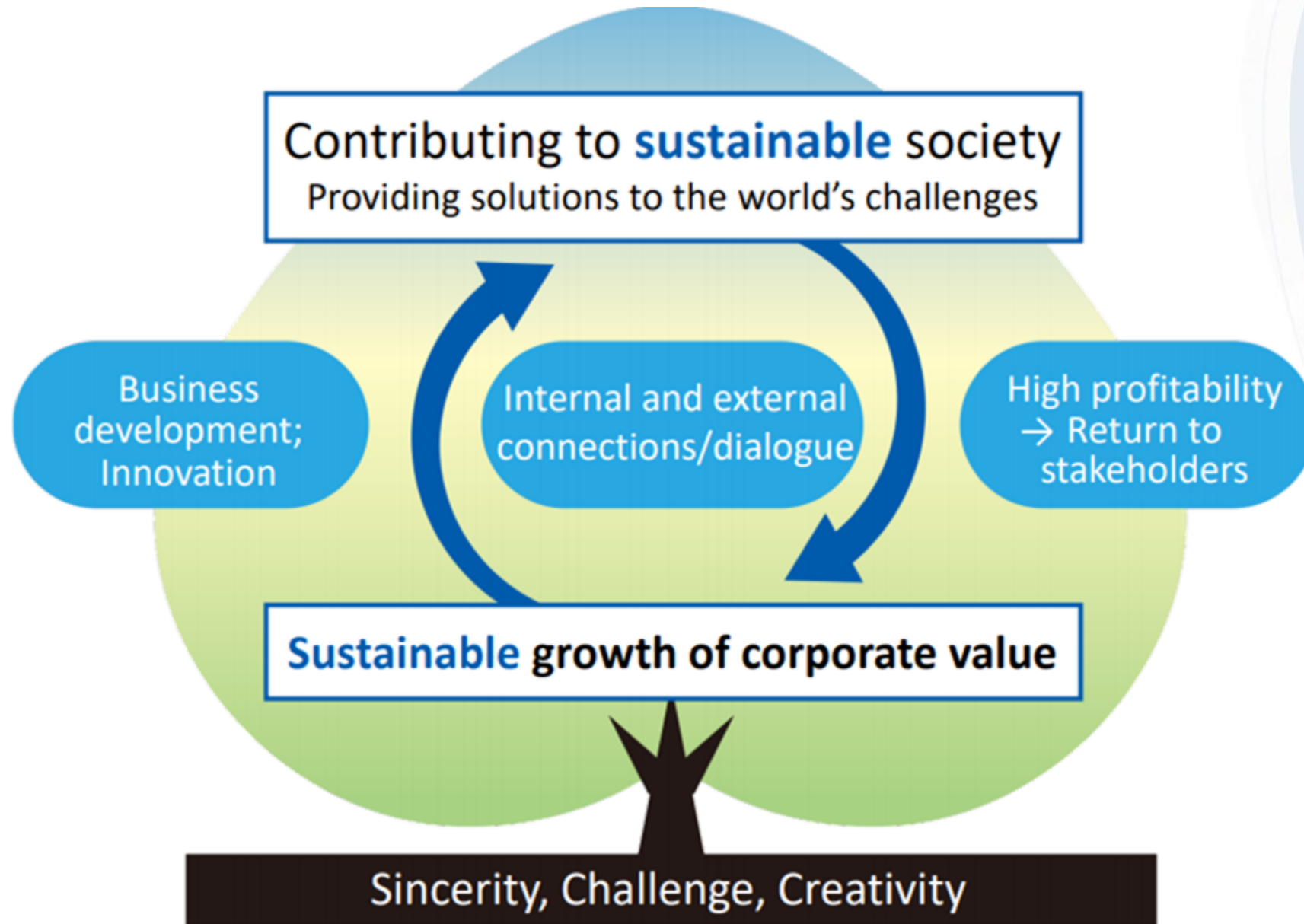
RWTH AACHEN  
UNIVERSITY

DEUTZ

MHPS GROUP



# Sustainability for Asahi Kasei





## *Creating for Tomorrow*

### THE COMMITMENT OF THE ASAHI KASEI GROUP:

To do all that we can in every era to help the people of the world make the most of life and attain fulfillment in living.

Since our founding, we have always been deeply committed to contributing to the development of society, boldly anticipating the emergence of new needs.

This is what we mean by “Creating for Tomorrow.”

