

## Asahi Kasei's Activities On A Green Hydrogen

14 October 2020

Hydrogen Energy Ministerial Meeting

Asahi Kasei Corporation

Executive Officer

Masami Takenaka Ph.D.

Creating for Tomorrow

## About Asahi Kasei Corp.

## Trade name

Asahi Kasei Corp.

## Head office

Tokyo, Japan

## Founding

1922

## President

Hideki Kobori

## Paid-in capital\*

¥103.3 billion

## Employees\*

39,283

## Fiscal 2018 results

Net sales ¥2,170.4 billion

Operating income ¥209.6 billion

*\* As of March 31, 2019*

## Head Office

***Diversified chemical company with three business sectors***

Asahi Kasei Corp. [holding company function]

### Material



- Asahi Kasei Corp.
- Asahi Kasei Microdevices Corp.

### Homes



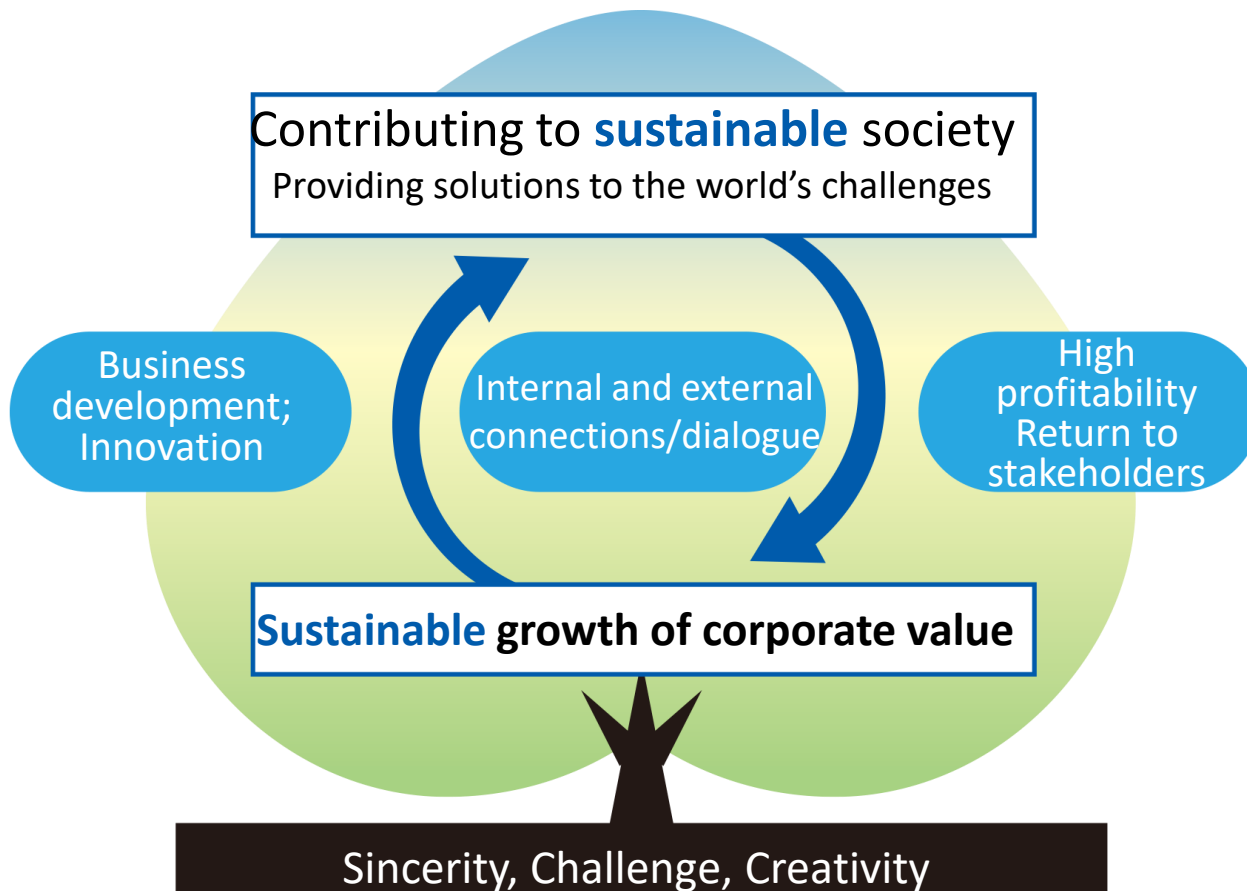
- Asahi Kasei Homes Corp.
- Asahi Kasei Construction Materials Corp.

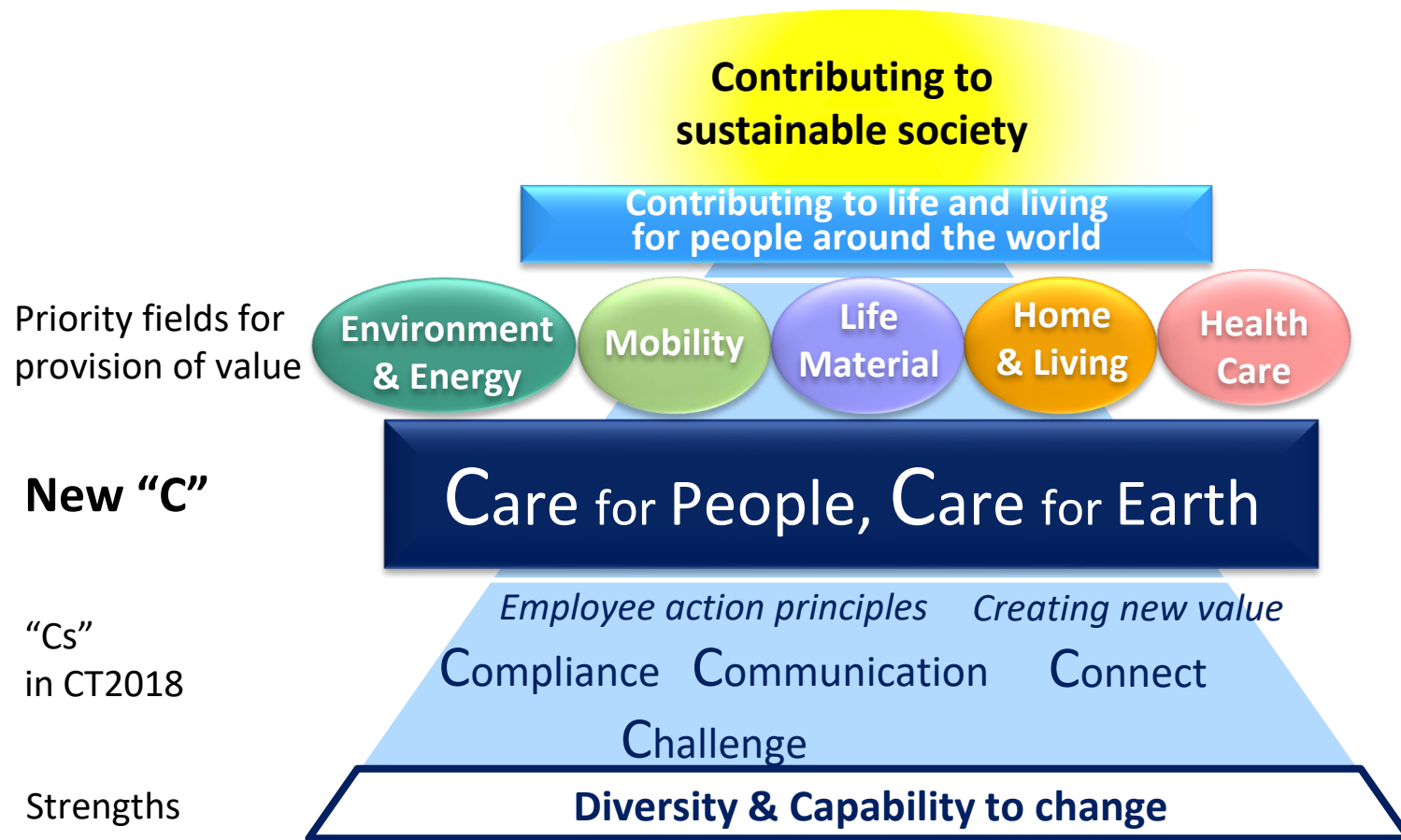
### Health Care



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







Contributing to the environment with various technology  
(CO<sub>2</sub> chemistry, semiconductors, etc.)



## Global challenges/trends



Greater adoption of clean energy



Transition to low-carbon society

## Care for Earth

### Clean energy

Battery separators

Alkaline water electrolysis system  
to produce green hydrogen

### Energy conservation/ environmental improvement

CO<sub>2</sub> sensors

Water filtration modules

Ion-exchange membranes

### Low-carbon society

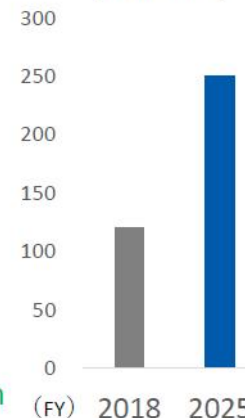
Next-generation CO<sub>2</sub> chemistry

New CO<sub>2</sub> separation/recovery system

Green indicates under development

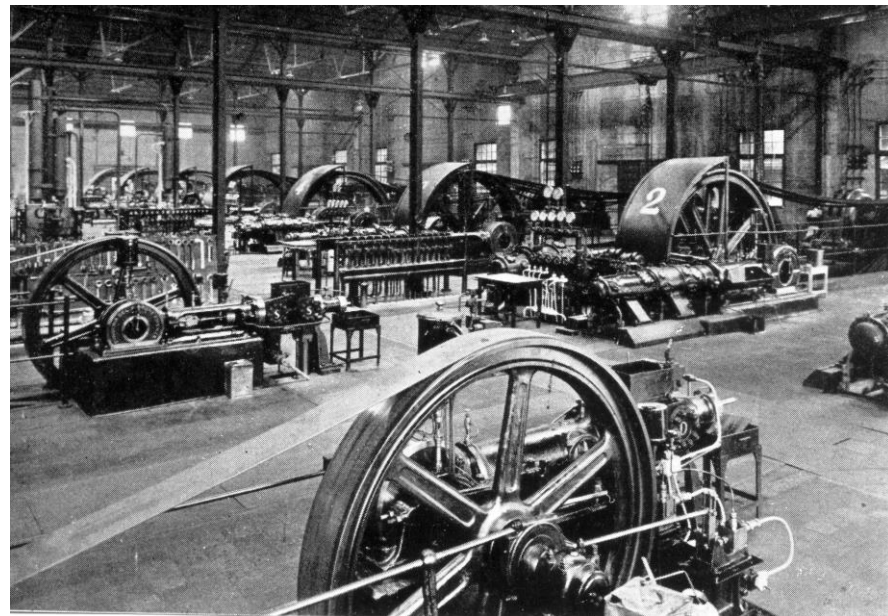


(¥ billion) Net sales



Note: Some overlap with other fields

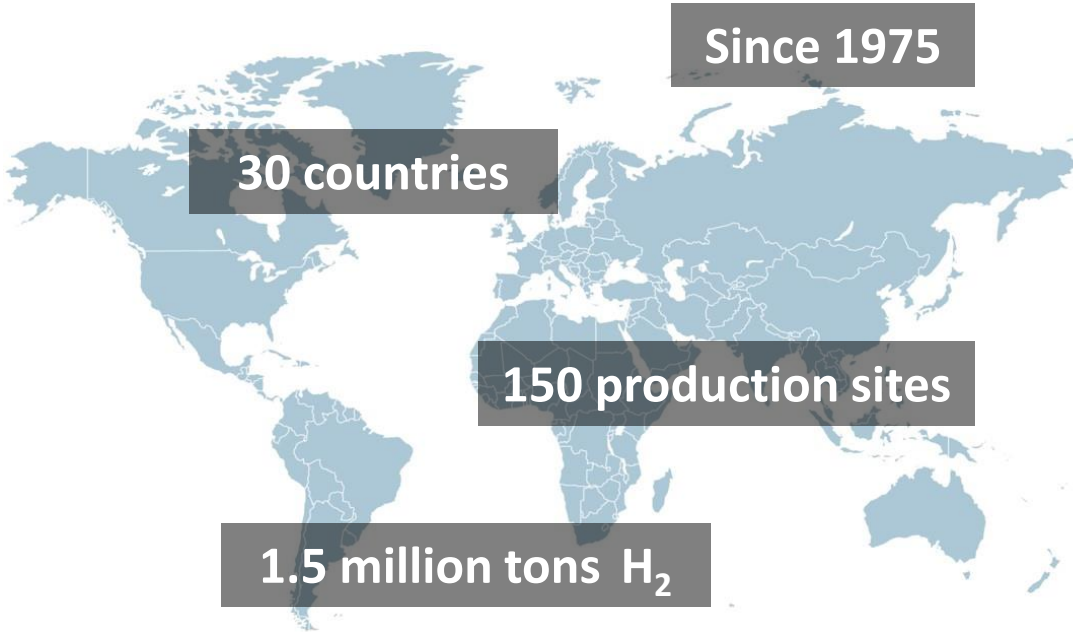
- We started hydrogen production by water electrolysis in 1923, using electricity from our own hydro power stations which are still in use.
- Asahi Kasei is the first Japanese company that industrialized ammonia production





# Leading One-Stop Solution Provider For The Chlor-Alkali Industry

Asahi**KASEI**





# Fukushima Hydrogen Energy Research Field (FH2R)





**TOSHIBA**



Tohoku Electric Power Co., Inc.



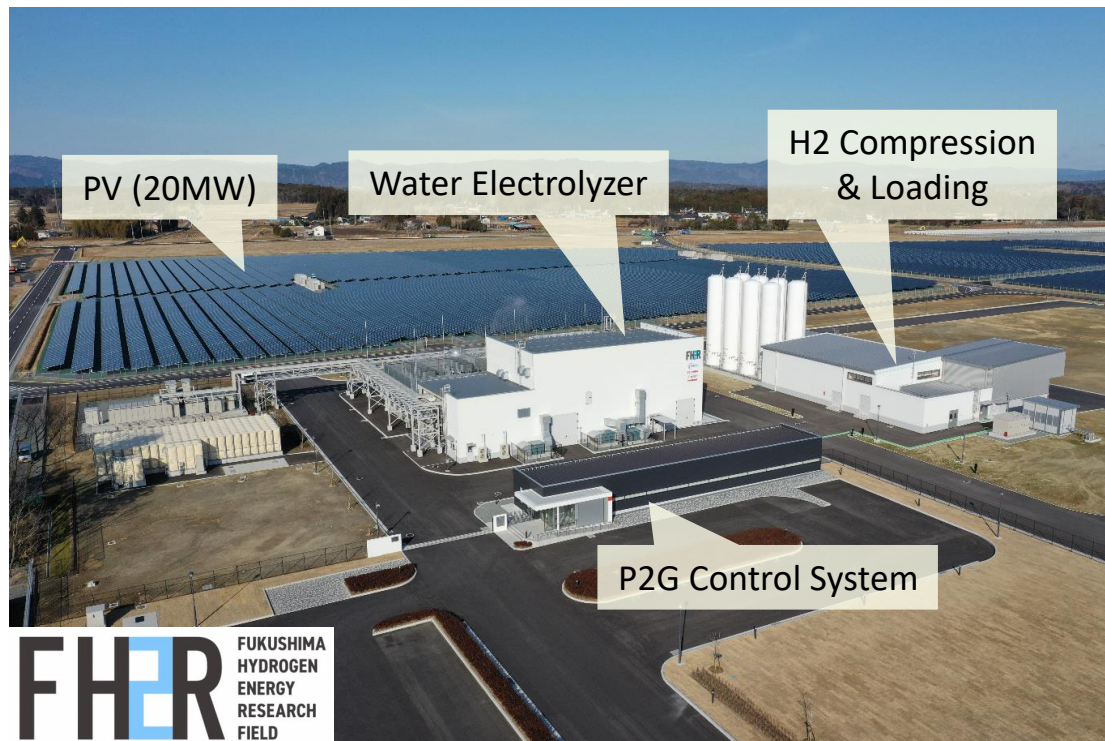
Tohoku Electric Power Network Co., Inc.

**Iwatani**

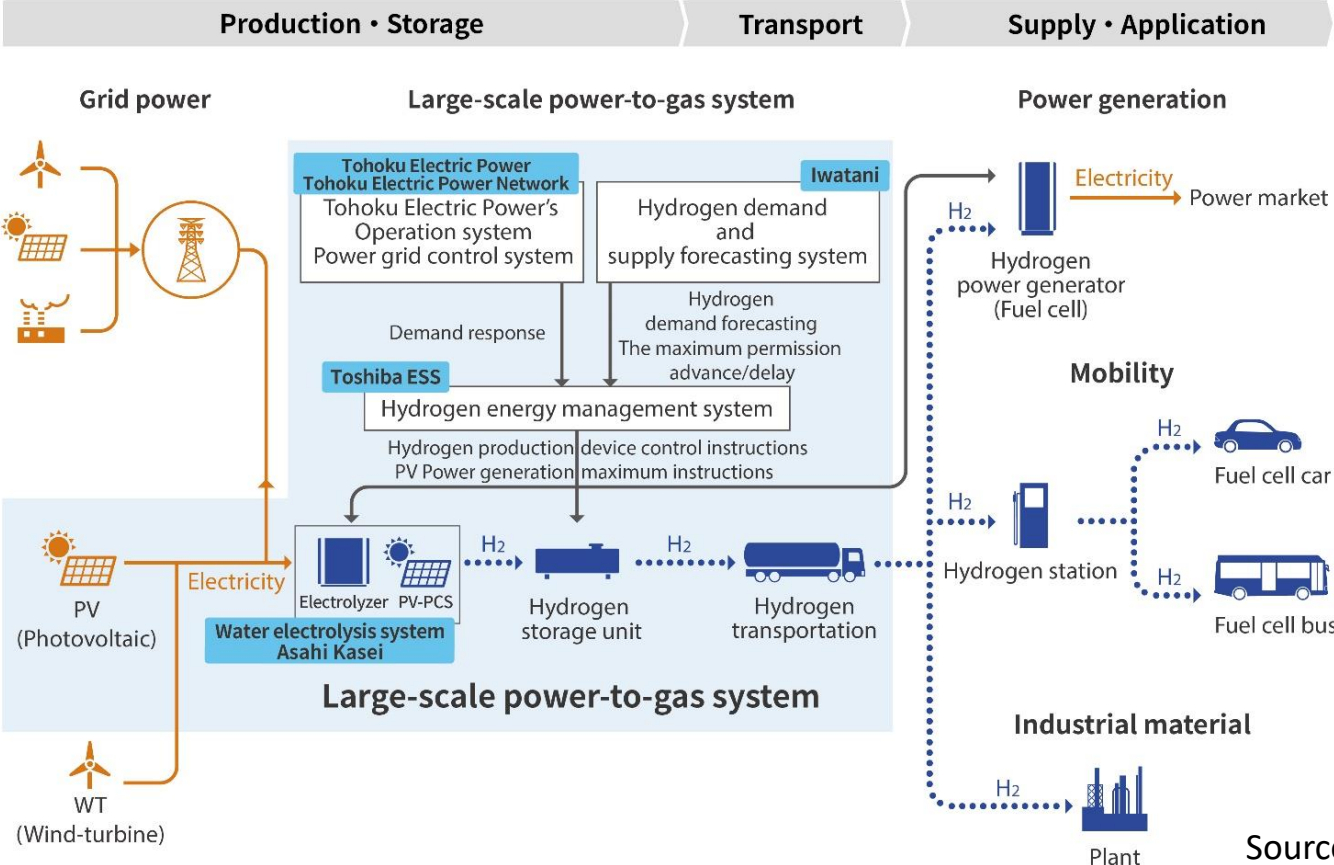
AsahiKASEI



Opened on Mar. 7, 2020  
in Namie, Fukushima  
as a NEDO development project



Source: NEDO



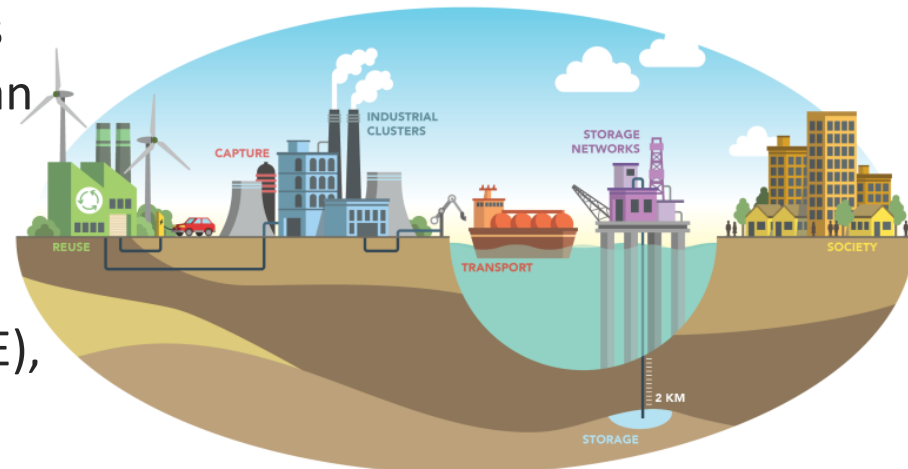
Source: NEDO



Input Power	max. 10 MW
Hydrogen Production	300 to 2000 Nm <sup>3</sup> /h (27 to 180 kg/h)
Power Variation Rate	±0.5 MW/s
Hydrogen Pressure	8 bar (by using compressor)
Hydrogen Purity	≥ 99.97% (ISO14687-2 Grade)
Number of Electrolysis Cells	170 cells

# ALIGN-CCUS PJ In Europe

- ALIGN-CCUS unites 30 research institutes and industrial companies from 5 European countries (DE, NL, NO, RO, UK).
- WP4 which AK is joining, consists of RWE(DE), MHPSE(DE), TNO(NL), Julich(DE), RWTH Aachen(DE) and FEV(DE).
- Aiming at transforming six European industrial regions into low-carbon centres by 2025.



**WP1 CAPTURE**

- Emission control
- Solvent management
- Dynamics and control
- Cost reduction

**WP2 TRANSPORT**

- CO<sub>2</sub> shipping
- Batch-wise injection
- CO<sub>2</sub> specifications
- Planning for flexible networks

**WP3 STORAGE**

- Standardizing storage readiness
- North sea storage appraisals
- Re-use of existing assets

**WP4 RE-USE**

- CCU demonstrator construction
- Engine adaption
- Operation and testing
- CCU integration and scale-up

**WP5 INDUSTRIAL CLUSTERS**

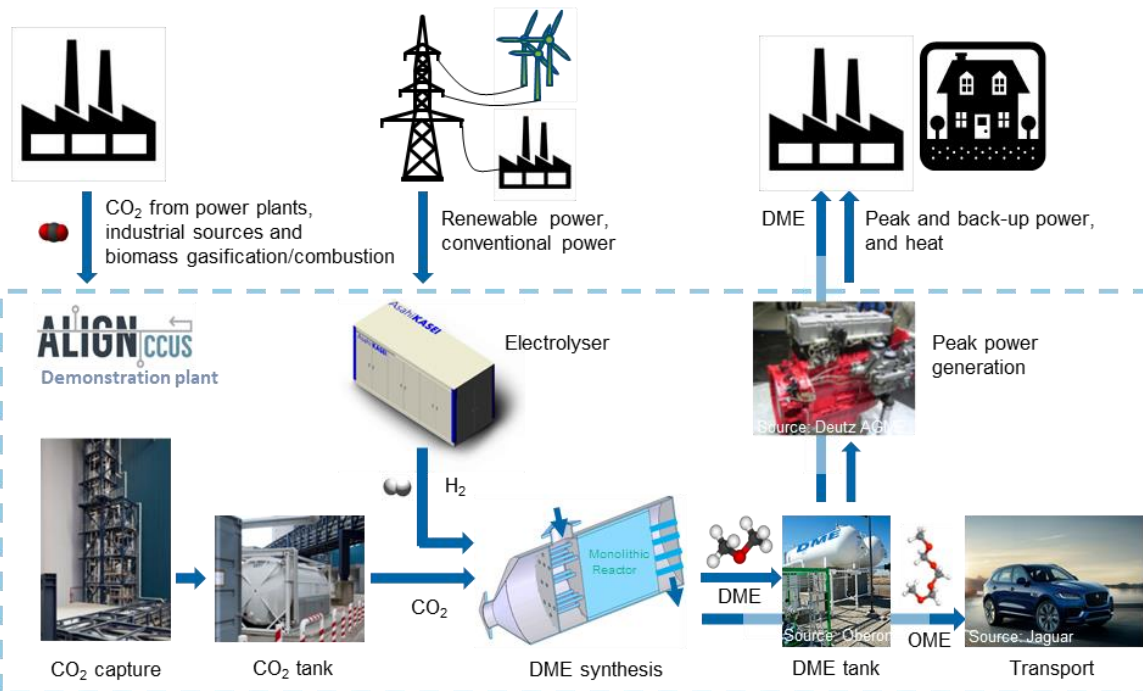
- Teesside and Grangemouth (UK)
- Rotterdam (NL)
- North Rhine-Westphalia (DE)
- Grenland (NO)
- Oltenia region (RO)
- Commercial models for CCUS clusters

**WP6 SOCIETY**

- Assessing public opinion
- Compensation strategies
- Improving EU dialogue on CCUS



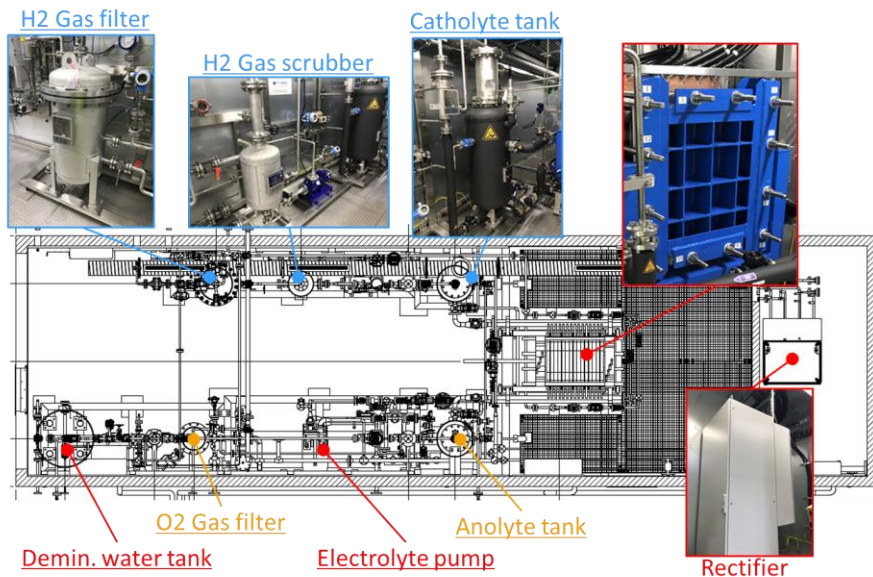
- Pilot plant at RWE's Coal Innovation Centre in Niederaussem in Germany
- Sector coupling and carbon recycling / synthetic fuels from CO<sub>2</sub> capturing
- Asahi Kasei provides electrolyser module to convert water into hydrogen



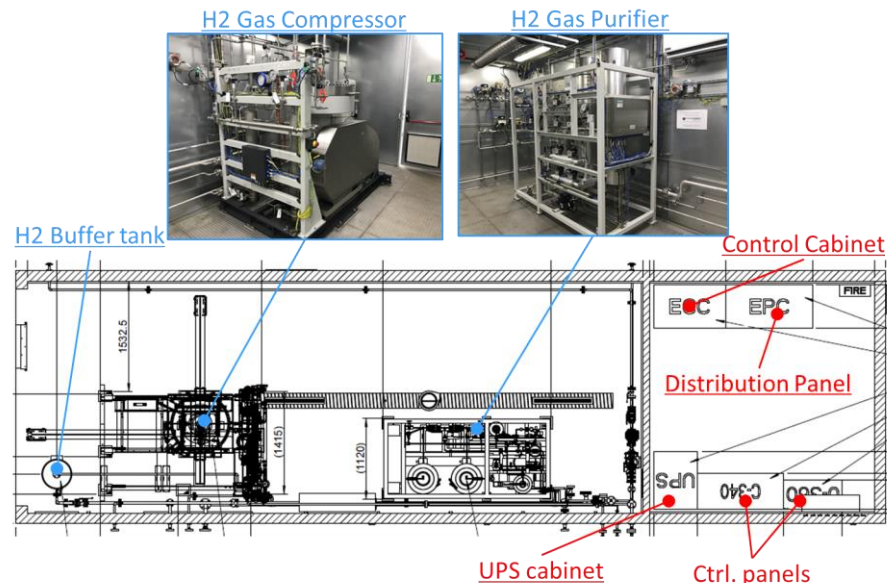
- Start of basic engineering for the project in January, 2019
- Placing of two-containers system at the power plant of RWE in October, 2019
- Now proceeding test operation of electrolyzer system at the site
- Demonstrate the total process to produce DME by the end of November in 2020



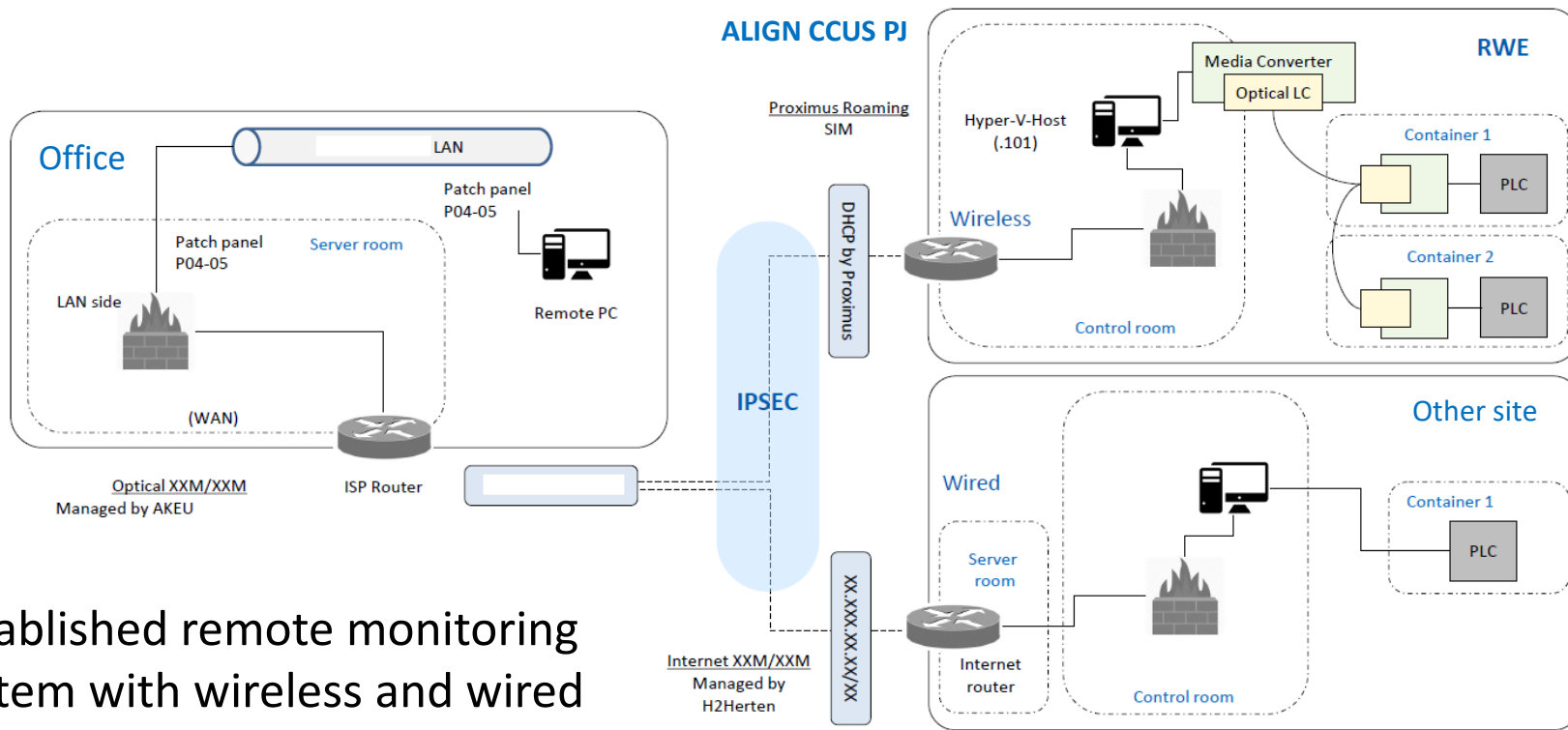
## Container1: Electrolyzer stack



## Container2: Accessories

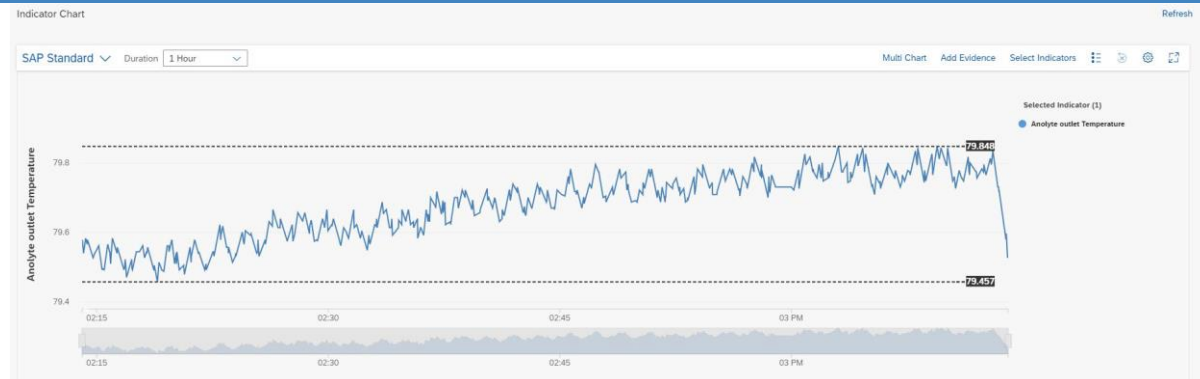


The all system is applied European and German standards and RWE internal safety rules.

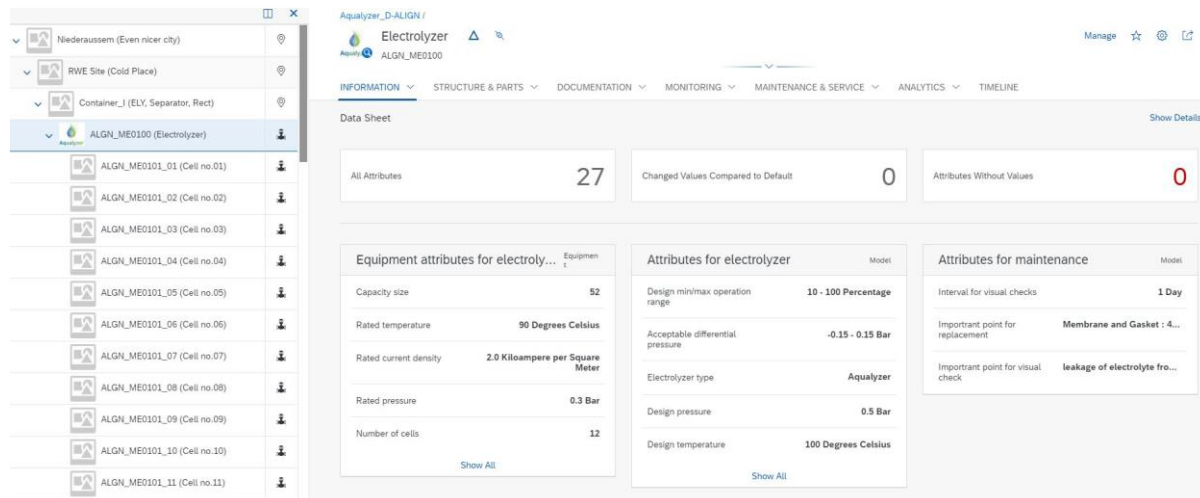


Established remote monitoring system with wireless and wired connect.

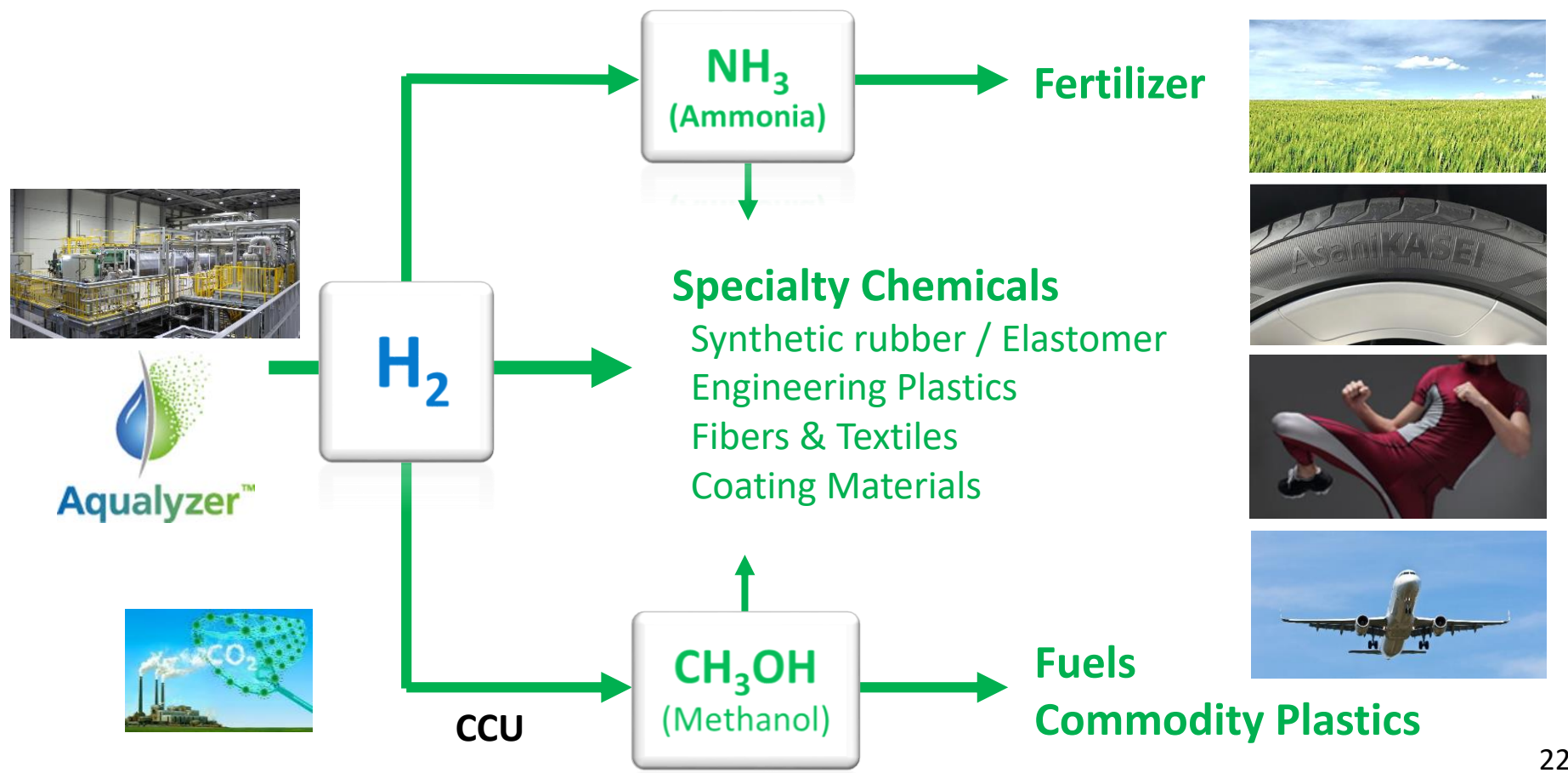
The interface on remote monitoring  
(ex. Temperature data)



Asset management system  
for planned maintenance.  
Here is stored the data on  
locations, components,  
spare parts, documents,  
maintenance, etc...



## Hydrogen for More Sustainable Chemicals





# Creating for Tomorrow

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.”



**AsahiKASEI**