

# Initiatives for sector integration at Asahi-Kasei

2019.9.25

Asahi Kasei Corp.

Shigeki Takayama

# Brief Introduction of Asahi Kasei

*Confidential*  
Asahi**KASEI**

- ❑ Diversified chemical company with three business sector
- ❑ About 39,000 employees over 15 countries, headed in Tokyo Japan
- ❑ Around ¥2,200 billion (€17B) net sales (2018)

Trade name

Asahi Kasei Corp.

Head Office

Chiyoda, Tokyo

Founding

1922

President

Hideki Kobori

Paid-in capital

¥ 103.4 billion (\$ 0.95B )

Employees\*

39,283 \* As of March 31, 2019

Fiscal 2018 results

Net sales:

¥ 2,170 billion (€17B)

Operating income:

¥ 210 billion (€1.7B)

€=JPY125



Asahi Kasei Corp. [holding company function]

**Material**



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

**Health Care**



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

**Homes**



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

# Major Products of Material Sector

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## Material



- ❑ Our products range from basic chemical materials to electronics.
- ❑ Strong market leader of the following products all over the world.
- ❑ Consume tens of thousands of tons of hydrogen



World  
No. 2

- Acrylonitrile



- Leona™ PA66 resin



Asia  
No. 1

- S-SBR (synthetic rubber)



World  
No. 1

- Hipore™ Celgard™  
Lithium-ion battery separator



Japan  
No. 1

- Saran Wrap™  
food wrapping film



World  
No. 1

- Cupro fiber/fabric



World  
No. 1

- Electronic compass



- UVC-LEDs



Global  
Top

- Ion-Exchange Membrane  
Chlor-alkali electrolyzer

# Power Plants which has been the foundation of Asahi kasei's business

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Hakusi power plant



Kawabasirigawa No.1 power plant



Kawabasirigawa No.2 power plant



Suigasaki power plant



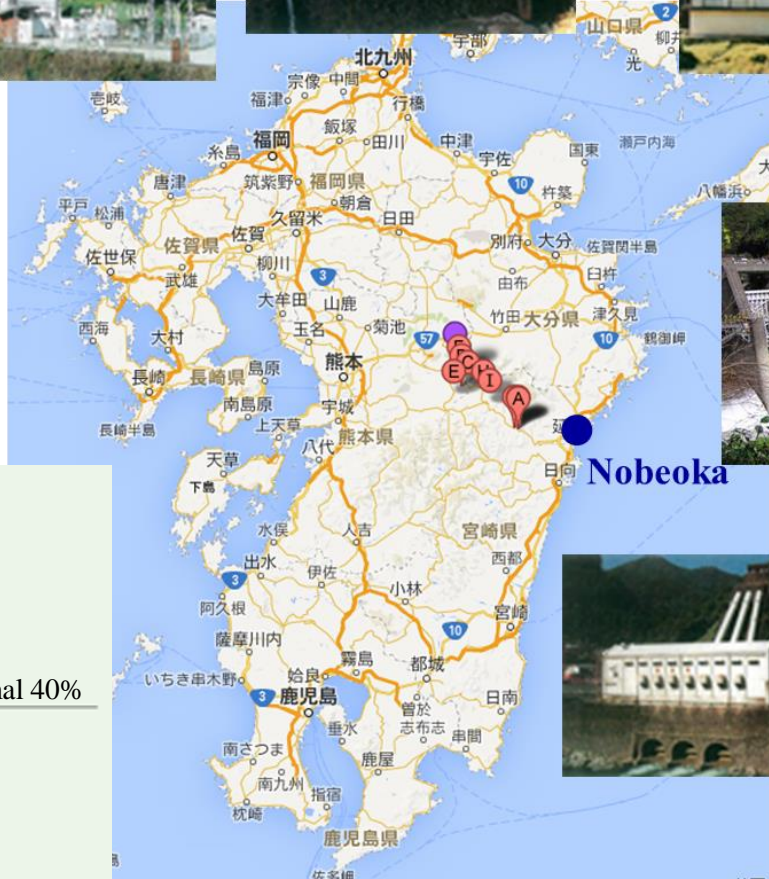
Hoshiyama power plant



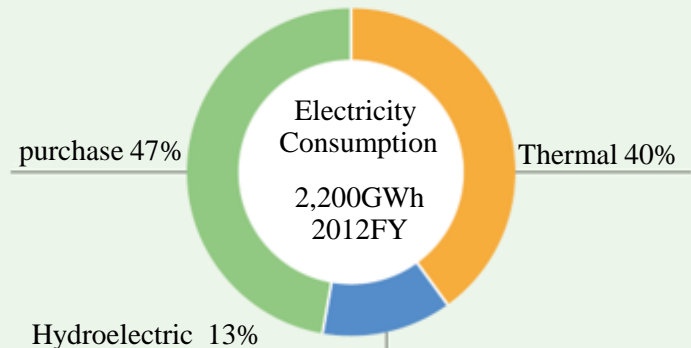
Mamihara power plant



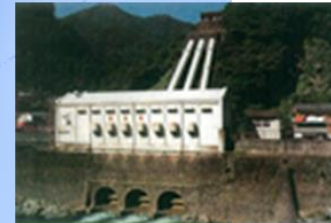
Nobeoka



Power supply ratio to Asahi kasei (domestic)



Gokasegawa power plant



- Seven hydropower plants cover 13% of in-house power demand
- Frequency conversion technology between our own 50Hz and purchased 60Hz supports it

# History of Asahi's electrolyzing technology

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We started Hydrogen production by Water Electrolyzing in 1923, using electricity from our own hydroelectric power plant.

Asahi Kasei is the first Japanese company that industrialized Ammonia Production just 10years after BASF(by conventional Haber-Bosch process) did.

Shitagau Noguchi, who founded Asahi Kasei, invited Italian Chemical Engineer Dr. Casale, and constructed Ammonia production Plant in 1923, in Nobeoka city Miyazaki Prefecture Japan. At that time he introduced Fauser's Water electrolyzing system for Hydrogen production. This is the origin of Asahi's electrolyzing technology.



Monument of Casale's High Pressure Ammonia production Plant in Nobeoka city



Shitagau Noguchi and Dr. Casale

# Asahi Kasei's Chlor-alkali electrolyzer business *Confidential*

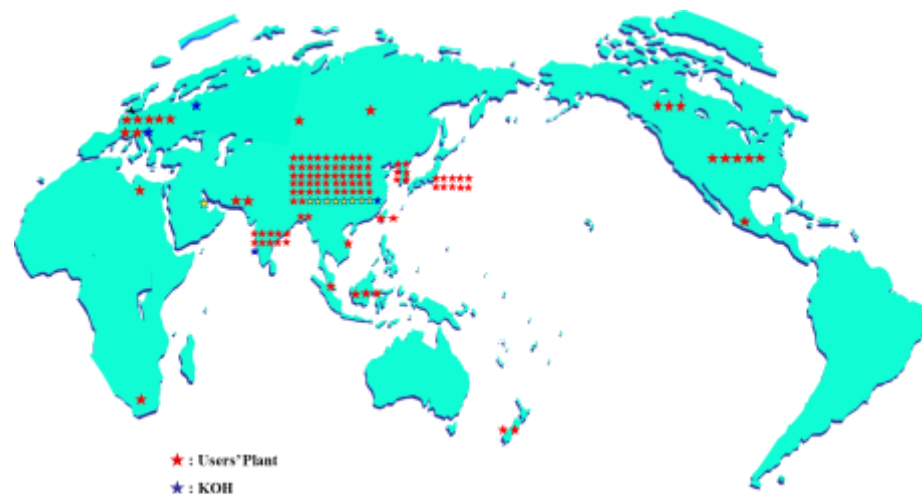
Asahi**KASEI**

Since 1975, Asahi Kasei has supplied Chlor-Alkali Electrolyzer system all over the world and still continue to polish our system.

+Total production capacity installed by Asahi Kasei's System  
over 7.5 billion Nm<sup>3</sup>-H<sub>2</sub> / year  
over 26 countries, 126 production sites

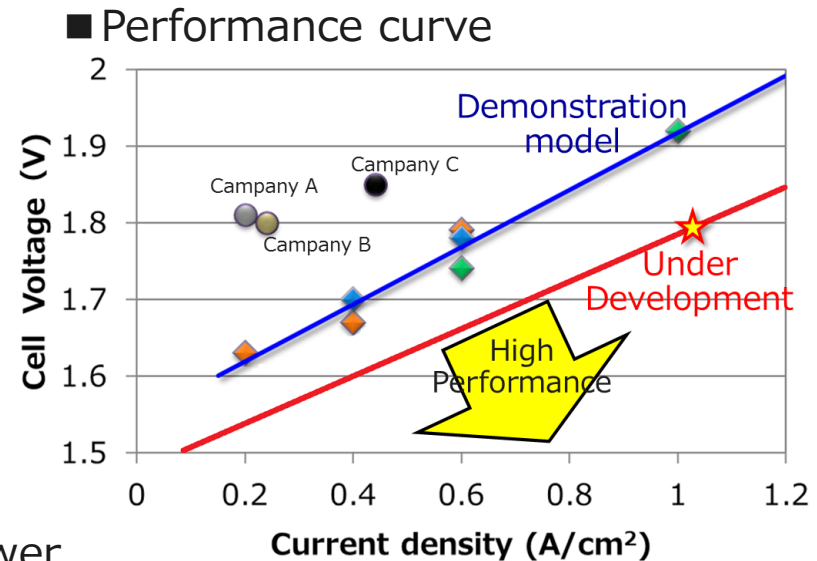


+Our customers in Europe,  
Dow Chemical in Hamburg  
BASF In Manheim  
Akzo-Nobel in the Netherland  
etc.

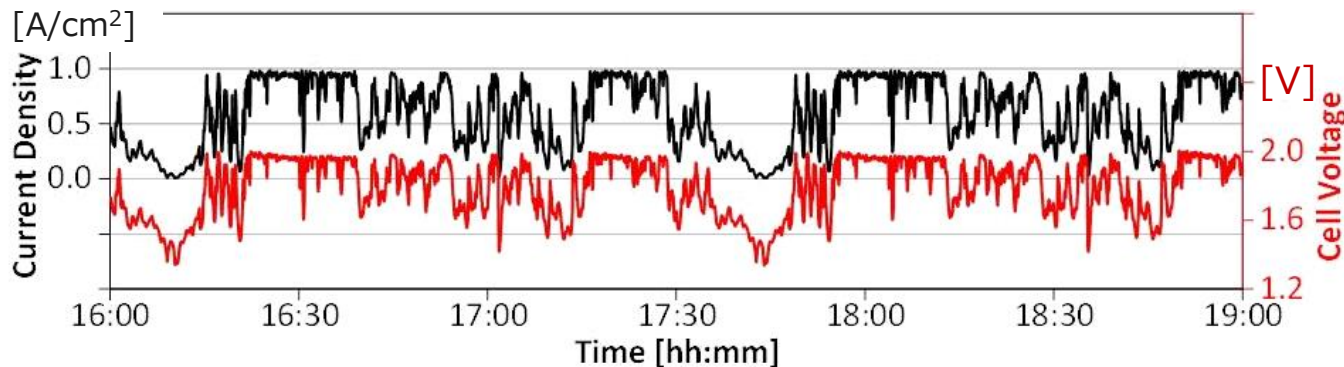


# Asahi Kasei's R&D together with NEDO Confidential AsahiKASEI

- ❑ We have been receiving many supports from NEDO & METI to date.
- ❑ We started collaboration with NEDO in 2014 on development for water electrolyzer.
- ❑ Achieved long term operation for 12,000 hrs stably
- ❑ Feature
  - High efficiency
  - High fluctuation tracking
  - Wide operating range



- Electrolyzer response to simulated wind power
  - Mid-cells (0 ~ 1.0A/cm<sup>2</sup>)



**Black:** Current density  
**Red :** Cell Voltage

# Demonstration Project

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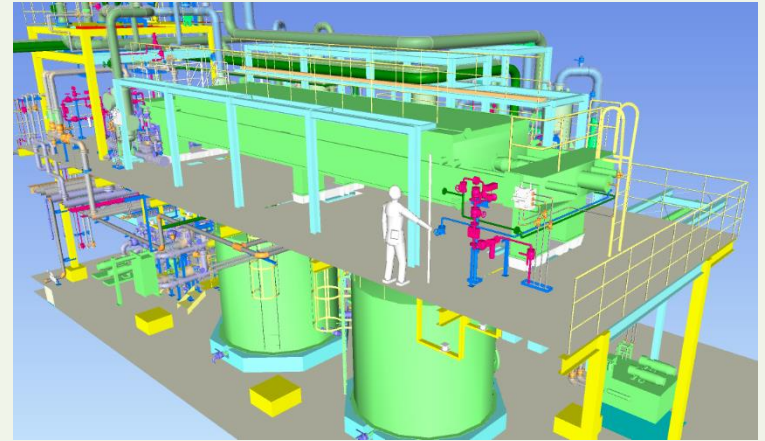
In Japan

## SomaPJ (150kw:Large cell size)



- extend the NEDO Project and relocate it to Soma
- Corroborate with IHI's smart community Project

## FukushimaPJ (Max. 10MW: Large cell size)



- We've received the order from Toshiba

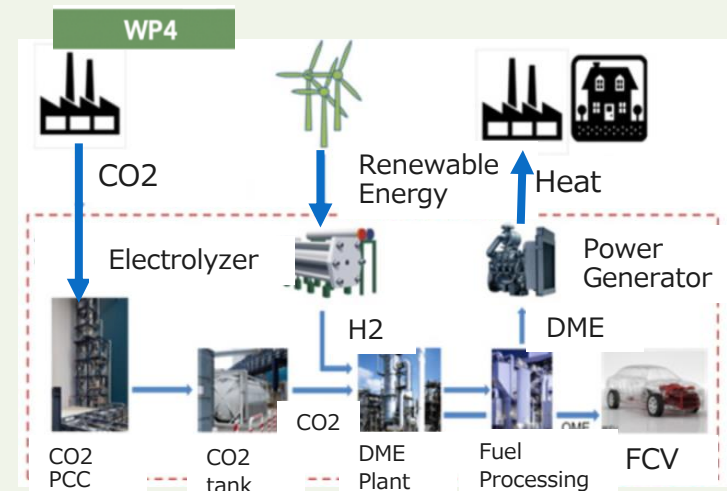
In Europe

## H2herten PJ (140kw:Middle cell size)



- At Herten in NRW, Germany

## Align CCUS



- At Niederraussem, NRW, Germany



# Large size water electrolysis system for Fukushima Project

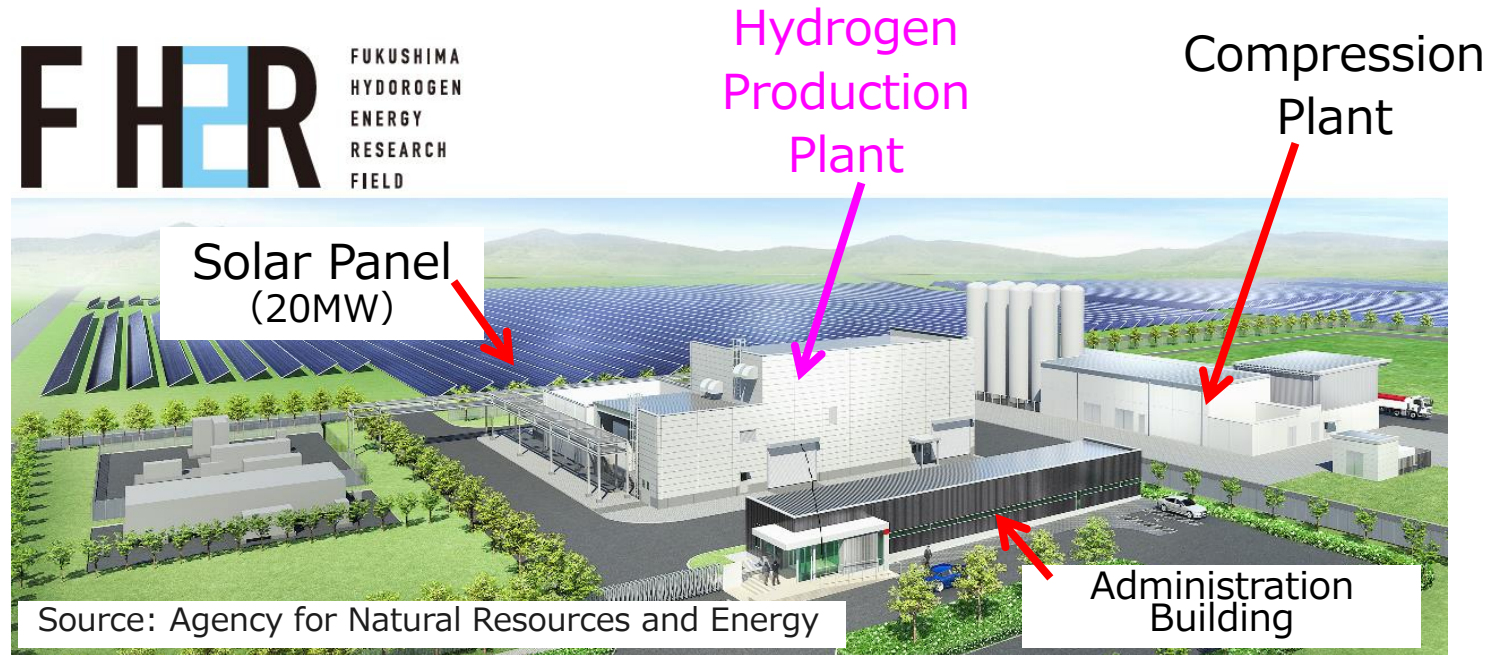
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**FHER**

FUKUSHIMA  
HYDROGEN  
ENERGY  
RESEARCH  
FIELD



Half-set electrolyzer test for Fukushima project

Output of rectifier : 10MW  
Max. H<sub>2</sub> supply : 2000Nm<sup>3</sup>/h  
(World's largest size as one unit)  
Cell area : about 3m<sup>2</sup>/cell  
Number of cells : 170cells

**Demonstration Start in 2020**

# Asahi Kasei's Business Plan

## ■ Middle size System

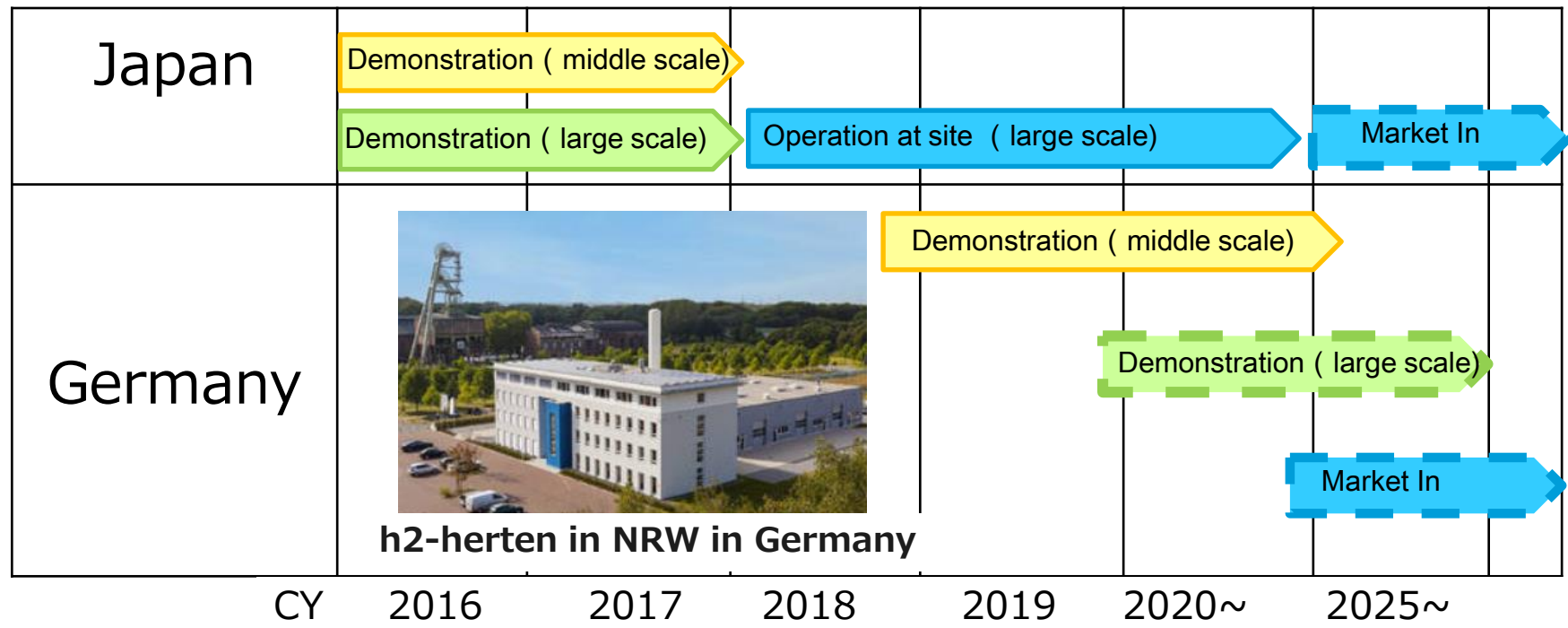


- ~1MW
- ~200Nm<sup>3</sup>/h
- in containers (20ft/40ft)

## ■ Large size system



- 10MW~
- 2,000Nm<sup>3</sup>/h~
- in a building



# Summary

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- Asahi Kasei started water electrolysis hydrogen production in 1923 using electricity from our own hydroelectric power station, and we still own 7 hydroelectric power stations.
- We have the world's highest level electrolysis technology based on more than 40 years of chloro-alkali electrolysis business experience.
- Two-year demonstration was carried out on medium and large scale electrolyzers with the support of NEDO and METI, and achieved long term operation for 12,000 hrs. stably, and demonstration projects are still being carried out in Germany and Japan.
- The water electrolyzer for demonstration at Fukushima Namie will be the world's largest hydrogen production per unit (2000Nm<sup>3</sup>/hr)
- We aim to enter the European market around 2025 by further improving efficiency and reducing costs.
- In Japan, we are considering sector integration for the chemical industry.

Thank you for your attention!!

# 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.”

**AsahiKASEI**