



JOGMEC's CCS Initiatives toward 2050 Carbon Neutrality

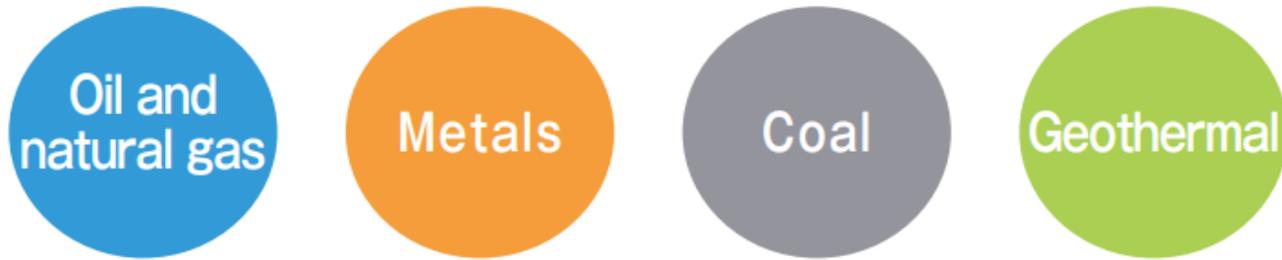
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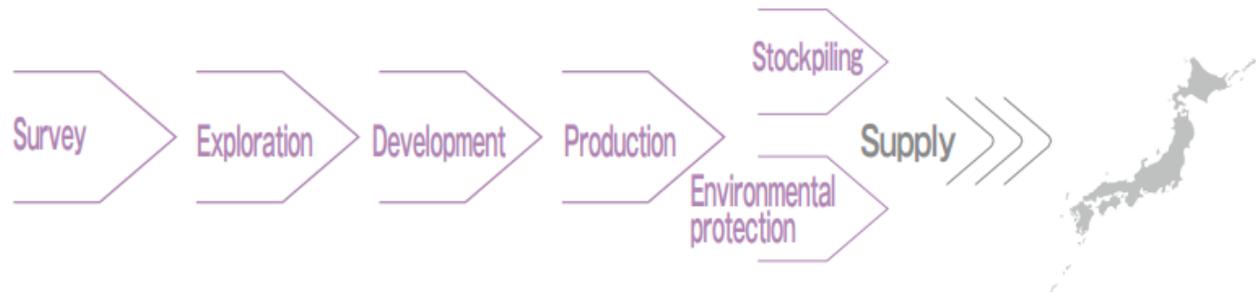
1. About us



➤ JOGMEC's 4 areas of responsibility



Flow of natural resource development



➤ JOGMEC Carbon Neutral Initiative

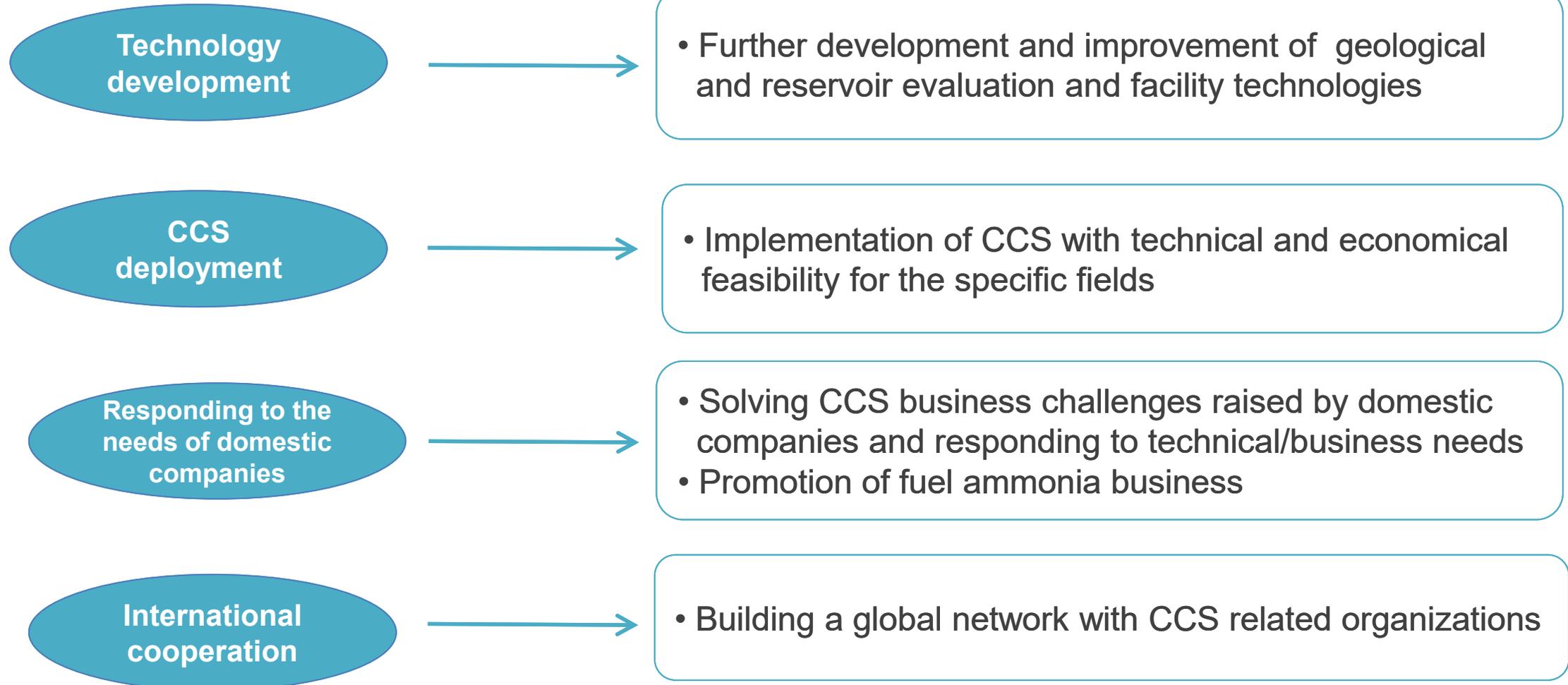
-April, 2021



<http://www.jogmec.go.jp/content/300372219.pdf>

Geological surveys	Marine resource development	Financial assistance	Technological development and technical support
Stockpiling	Environmental safety and mine pollution control	Collection and provision of information	Resource diplomacy and international cooperation

2. Our CCS initiatives



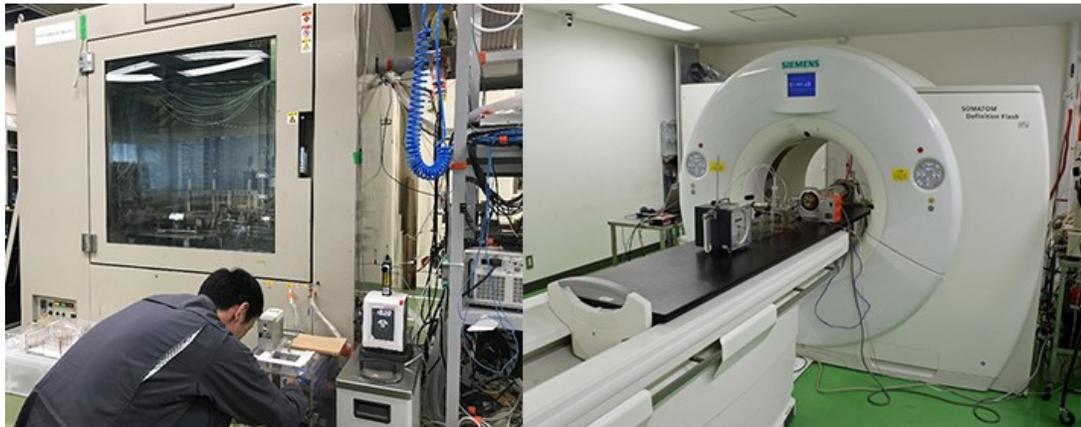
3. Technology Development

-Subsurface

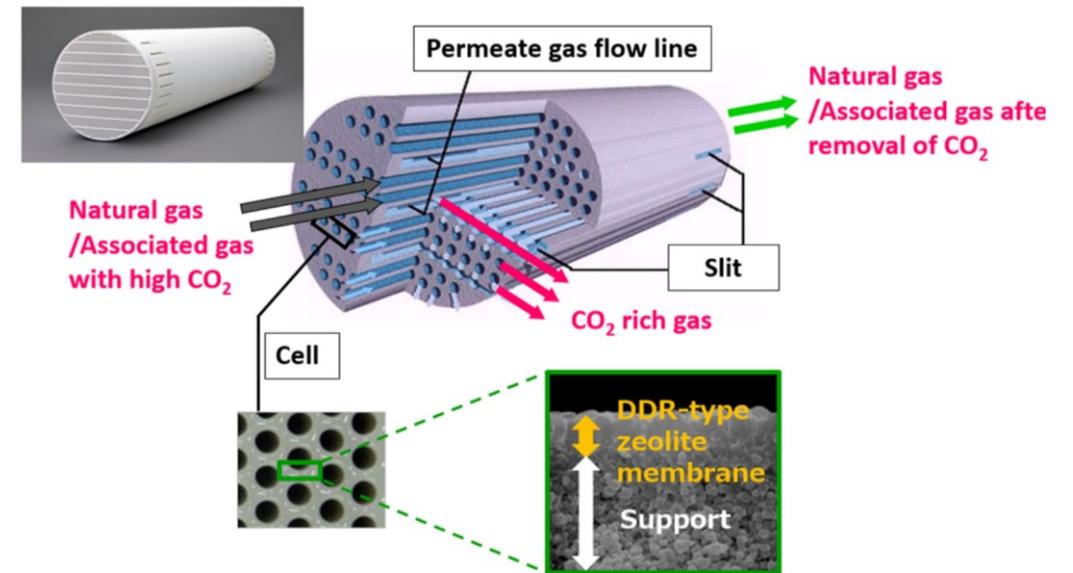
- Site screening and site selection
- Site characterization
- Evaluation of well integrity
- Modelling and simulation
- Monitoring and model calibration

-Surface

- CO₂ Separate (DDR) membrane
- SMR with CO₂ utilization

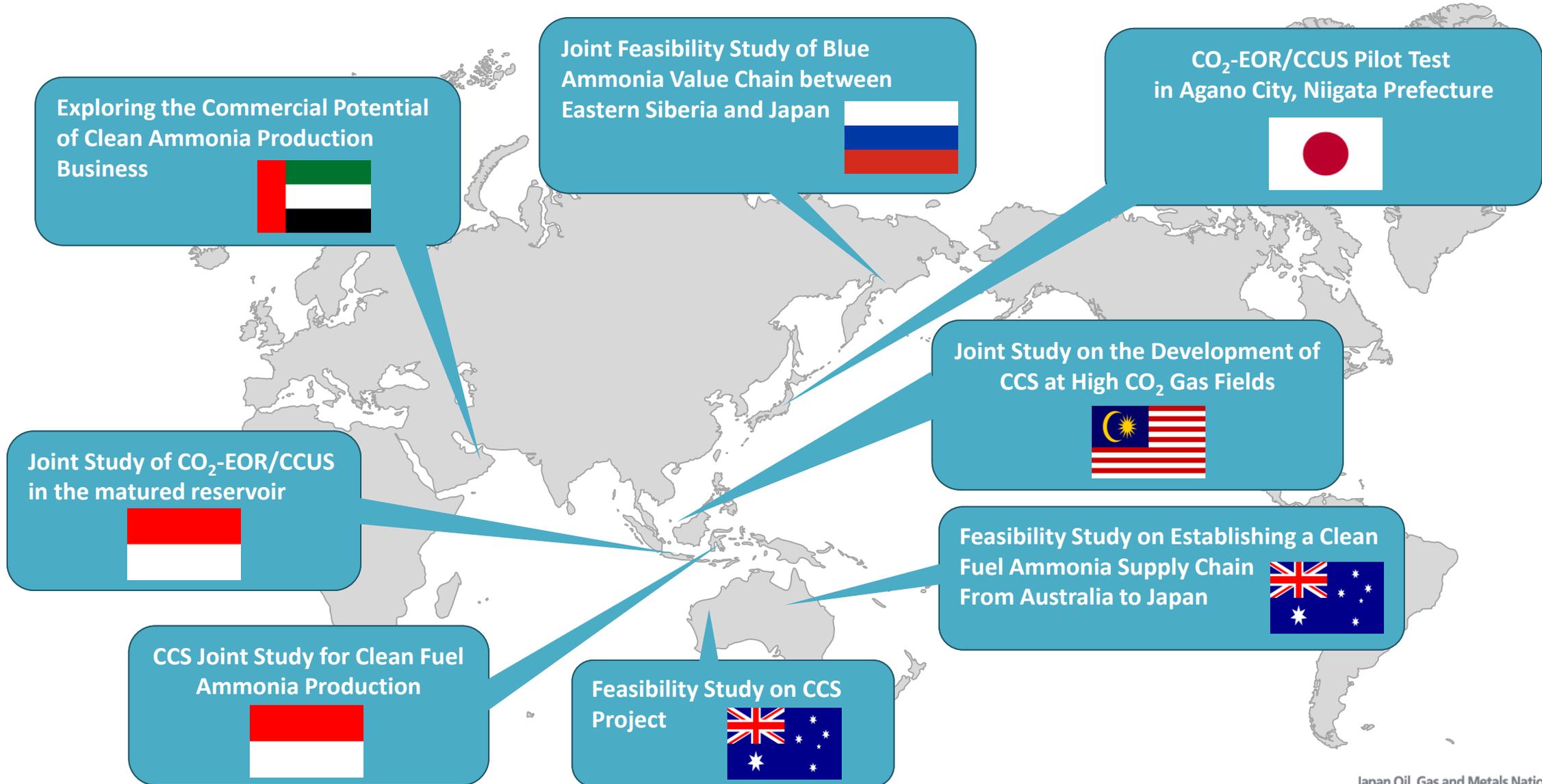


Coreflooding apparatus for relative permeability measurement at JOGMEC Technology Research Center



Structure of Large-Size Elements of the DDR-Type Zeolite Membranes
Source: 2019 news release | JGC Holdings Corp.

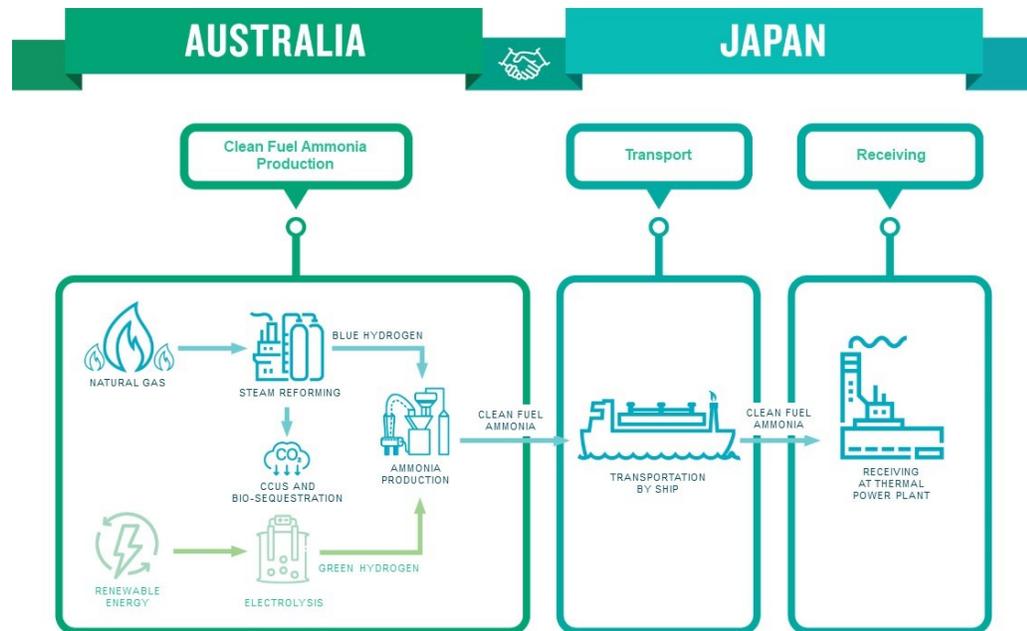
4. Project in progress - Overview



5. Feasibility Study on Establishing a Clean Fuel Ammonia Supply Chain from Australia to Japan



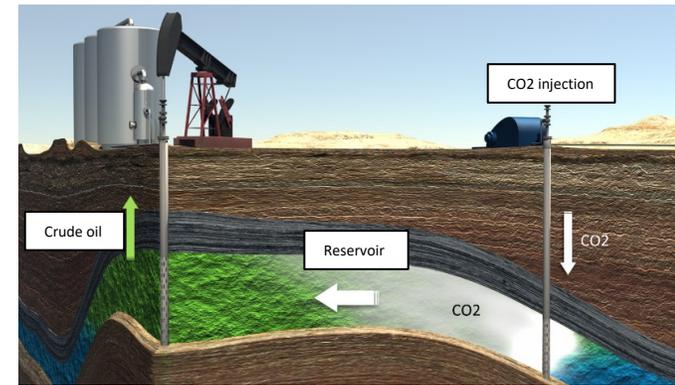
- Jointly with Woodside Energy Ltd., Marubeni Corporation, Hokuriku Electric Power Company, and The Kansai Electric Power Co. Inc, JOGMEC is conducting a feasibility study for the development of a clean fuel ammonia supply chain from Australia to Japan.
- The feasibility includes the production of clean fuel ammonia in Australia from natural gas with CO2 abatement methods such as CCS·CCU and bio-sequestration; marine transportation to Japan; utilization of ammonia as a fuel for clean power generation and marine use; and financing.



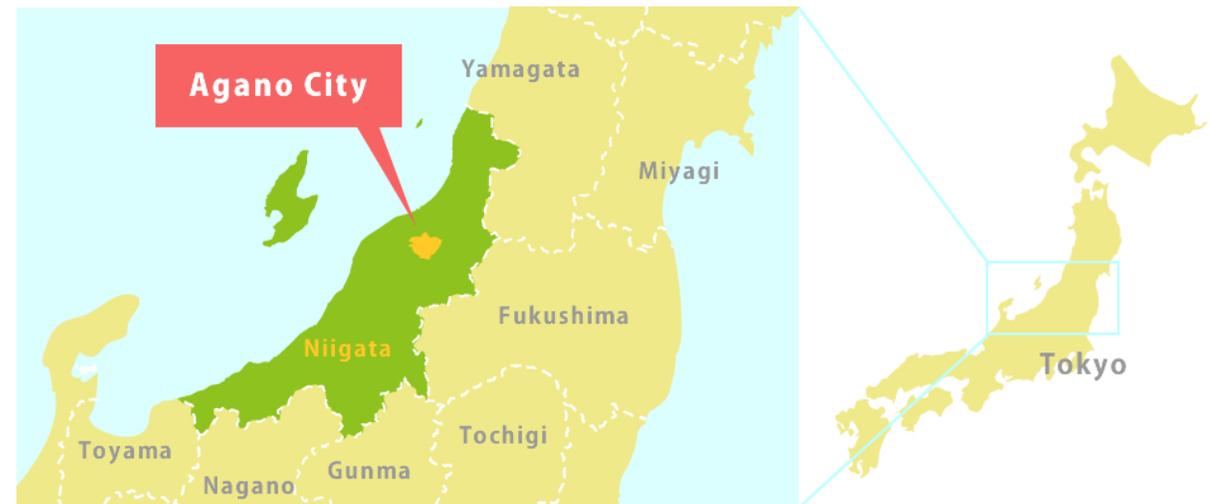
Signing of a joint research agreement (July 2021) | Is National Corporation

6. CO₂-EOR/CCUS Pilot Test in Agano City, Niigata Prefecture

- Jointly with INPEX, JOGMEC conducts a CO₂-EOR/CCUS pilot test at the Minami-aga Oil Field in Agano City, Niigata Prefecture.
- The pilot test is to demonstrate the improvement of CO₂-EOR efficiency currently under development at the INPEX Minami-aga Oil Field.
- As a portion of the CO₂ will remain underground following the recovery of crude oil, INPEX and JOGMEC also plan to verify the CO₂ behavior in the reservoir.
- Will proceed with preparatory work including formulating a detailed test plan, and plan to drill two new wells in 2022 and carry out the pilot test.



CO₂-EOR (Enhanced Oil Recovery)

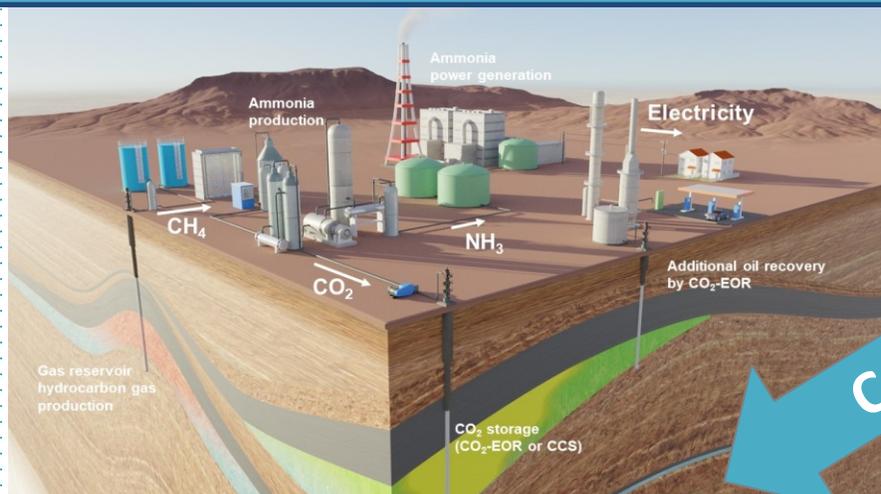


Source: <http://www.agano-spot.com/english/access/index.html>

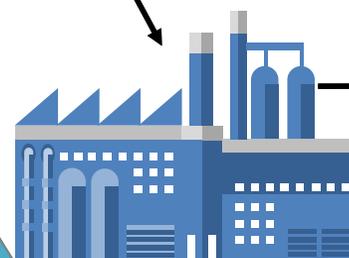
7. Way forward for CCS deployment

- In order to provide our technical / financial support with low-carbon projects using CCS, we will establish the following evaluation guidelines; CO₂ Geological Storage Capacity, Carbon Intensity, GHG emissions.
- The guidelines are based on existing standards including ISO 27914, DNV-SE 0473, IPIECA, GHG Protocol.

CO₂ Geological Storage Capacity



Exploration & Production



Carbon Intensity

LNG
Ammonia
Hydrogen

GHG emissions

8. Expanding our CCS initiatives through international cooperation



- International cooperation is important to develop and commercialize CCS. JOGMEC cooperates with several countries including Canada and Australia through existing programs and institutions.
- JOGMEC has participated as an advisory member of the Asia CCUS Network where we contribute technical expertise to CCS deployment in Asia.
- We also aim to contribute to an economical solution including the generation of carbon credits from CCS project.



➤ For more information

資源ミライ開発

<https://mirai.jogmec.go.jp/>

English version is now available!

➤ Inquiry

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Thank you.