



# Toward Fuel Ammonia Application

## JOGMEC's Support for Acceleration

Japan Oil, Gas and Metals National Corporation  
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# About JOGMEC

## JOGMEC's Activities



Oil and Natural Gas



Metals



Coal



Geothermal



Stockpiling



Mine Pollution Control

## JOGMEC Carbon Neutral Initiative:

Contribute to achieve carbon-neutral society by securing stable resource / fuel supply and strengthening initiatives that are consistent with climate change.

## Clean resources and energy

Fossil fuel development and decarbonization

Oil

Gas

LNG

Coal

Geothermal

Metals

Constructing hydrogen / ammonia supply chain and market expansion

Securing CCS-suitable sites

H<sub>2</sub>

NH<sub>3</sub>

Decarbonized fuel and technology

Contributing to system developments



Necessary systems for decarbonization



# Key issues for Fuel Ammonia Value Chain

## Ammonia Production

### <Challenges>

- Selection of CO<sub>2</sub> capture technology (Application for high CO<sub>2</sub> gas field)
- GHG emission and measurement of Carbon Intensity

## Transportation/Receiving

### <Challenges>

- Optimize ammonia distribution system
- Diversification of supply
- Demand creation
- R&D of ammonia co-firing

## CCS (CO<sub>2</sub> storage)

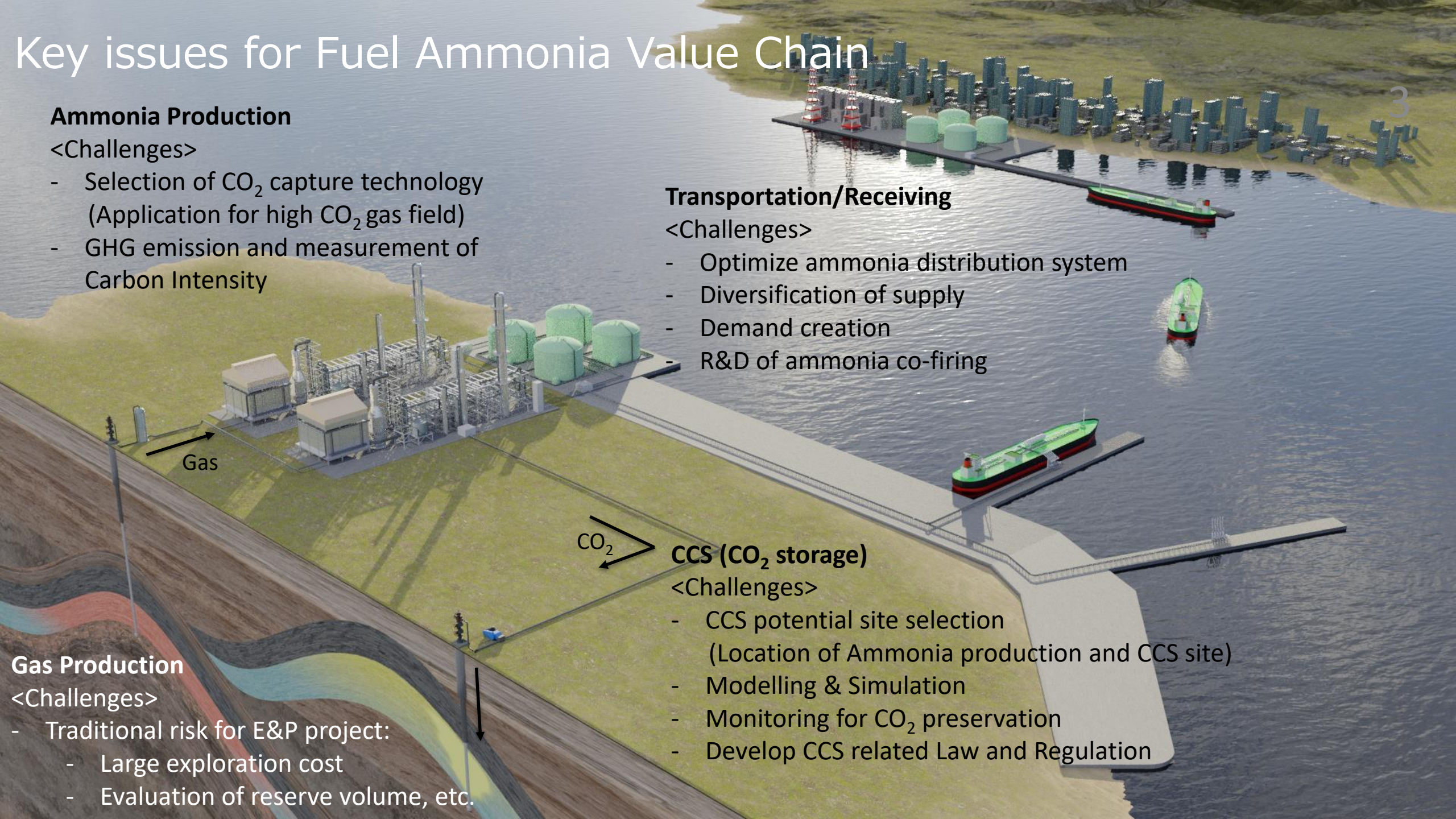
### <Challenges>

- CCS potential site selection (Location of Ammonia production and CCS site)
- Modelling & Simulation
- Monitoring for CO<sub>2</sub> preservation
- Develop CCS related Law and Regulation

## Gas Production

### <Challenges>

- Traditional risk for E&P project:
  - Large exploration cost
  - Evaluation of reserve volume, etc.





# Support for Value Chain Feasibility Study

## Abu Dhabi ⇒ Japan

- ADNOC, INPEX, JERA
- Easy access to gas source.
- CCS: CO<sub>2</sub>-EOR



## Russia (East Siberia) ⇒ Japan

- Irkutsk Oil Company, TOYO, Itochu
- Easy access to gas source.
- Long transportation by railway /pipeline.



## Indonesia ⇒ Japan

- ITB, PAU, Mitsubishi
- Utilize existing ammonia plant owned by PAU/Mitsubishi.
- CCS/CCUS study



## Australia ⇒ Japan

- Woodside, Marubeni, Kansai/Hokuriku Electric Power
- Easy access to gas source.
- Clean Ammonia supply chain study



## Australia ⇒ Japan

- MEPAU (Mitsui)
- Easy access to gas source
- CCS study



# JOGMEC's Contribution for CCS & Fuel Ammonia Value Chain

## Upstream Gas Field Acquisition

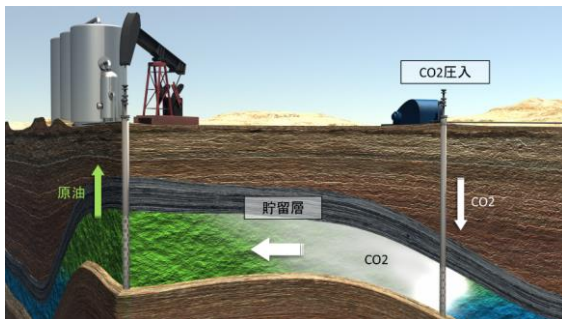
### Support upstream gas field acquisition for future gas source

- Joint study for project feasibility analysis, etc.
- Utilize existing JOGMEC's function:
  - Equity capital and liability guarantees for E&P project with CCS & fuel ammonia.

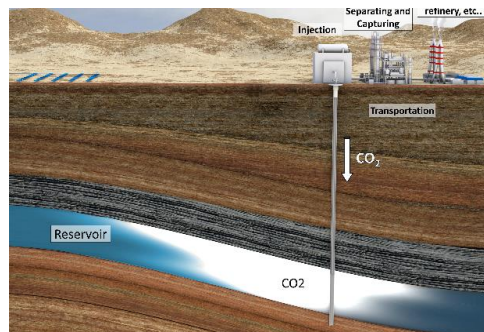
## CCS Project Support

### Support & advice for subsurface/surface analysis

- Site screening/selection/characterization
- Modelling, simulation,
- Monitoring and model calibration
- CO<sub>2</sub> separation membrane



CO2 Injection to oil reservoir (CO2EOR)



CO2 Injection to aquifer

## CO2 Emission / Carbon Intensity

### Support for clarify CO2 (GHG) emission and carbon intensity

- Prepare guideline for CCS and CO2 emission identification.
- Establish certification scheme of CCS project, etc.

## Ammonia Value Chain Study

### Support for fuel ammonia value chain

- Joint study to fuel establish ammonia value chain.
- Clarify feasibility of projects with their pros & cons.



PAU Plant in Indonesia



Flow scheme from Irkutsk





# Thank you

➤ For more information

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

English version will be available soon !

資源  開発

WE SUSTAIN THE FUTURE OF ENERGY