



Technological Challenges of Unconventional Gas Development

Oil & Gas



Metals



Stockpiling



**Mine Pollution
Control**



Coal



**Geothermal
Resources**



Hirobumi Kawano
JOGMEC

Japan Oil, Gas and Metals National Corporation

JOGMEC's Activities in Shale Gas

Financial Support

4 projects
in the west of
Canada

Joint Research

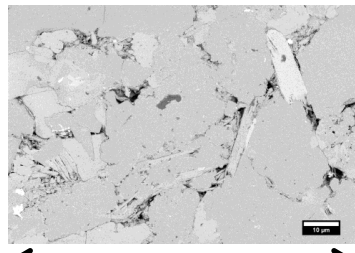
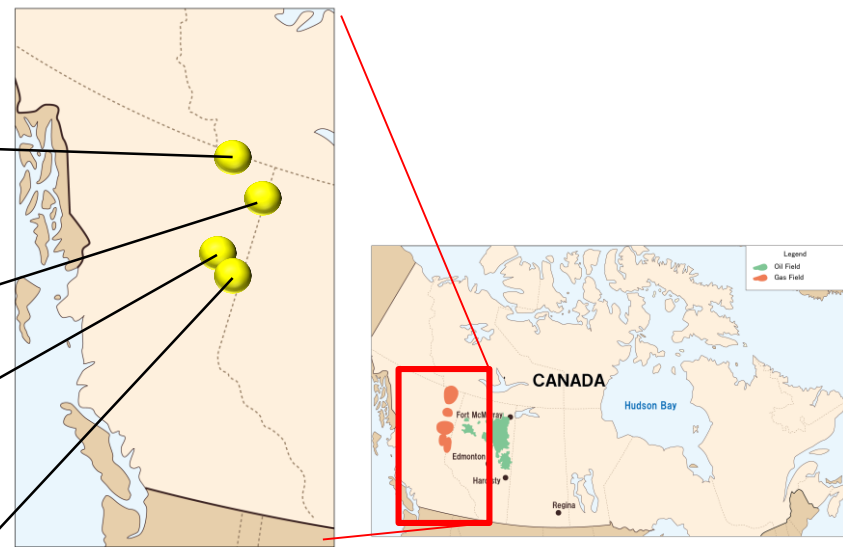
- Core Analyses
- Geomechanics
- Seismic

Mitsubishi Corp.
Cordova Basin

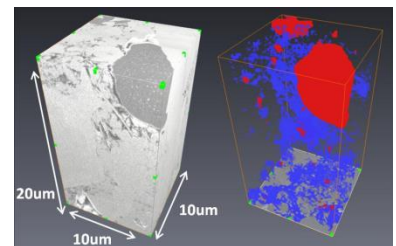
Mitsubishi Corp.
Cutbank Dawson Land

JAPEX
North Montney Land

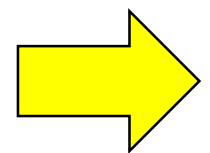
INPEX
Horn River, Cordova, Liard



100 um
SEM image of shale sample



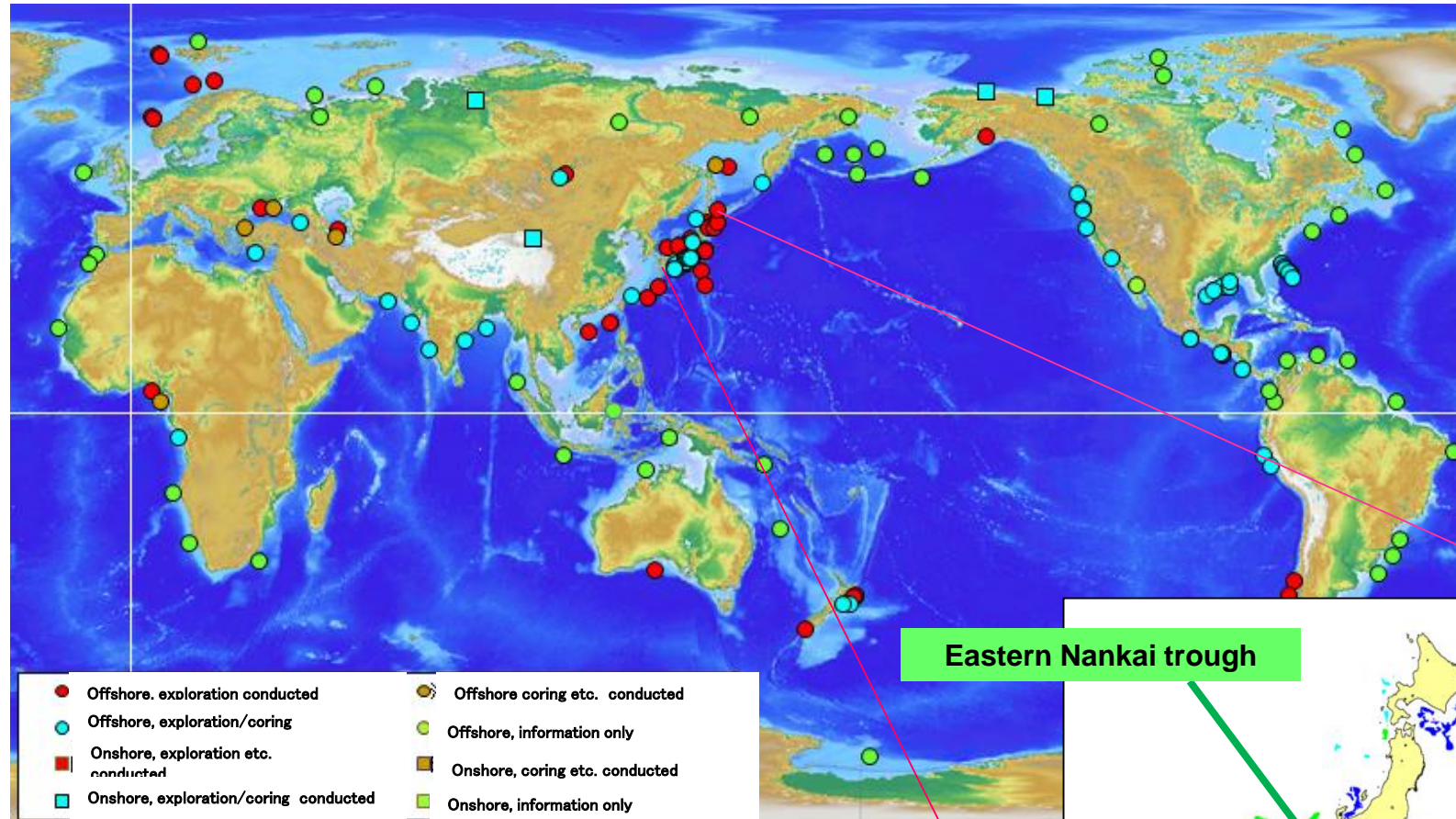
3D Model of shale pores



Increase of the asset values

- Cost reduction
- Productivity optimization

Methane Hydrate Distribution



Eastern Nankai trough

Japan Eastern Nankai trough: $1.1 \times 10^{12} \text{ m}^3$
✳equivalent to about 10 years of LNG import volume.

Japan's Methane Hydrate R&D Program

Phase 1
(FY 2001 – FY2008)

Basic Research

Onshore Production Tests



Heating Method

→ **Depressurization Method**

Resource Assessment in Eastern Nankai Trough



Phase 2
(FY 2009 – FY2015)

Technological Research
and Production Tests

Offshore Production Tests

The first methane hydrate offshore
production test in March, 2013

Test period: about 6 days
(March 12 - 18, 2013)

Depressurization method

Cumulative gas production : **120,000m³**

Average daily gas production : **20,000m³**



**Middle to Long-term
Onshore Production Test**

Phase 3
(FY2016 – FY2018)

Establishment of
Technological Platform

**Middle to Long-term
Offshore Production Test**

**Preparatory study for
Commercial Production**

Economical Feasibility

**Evaluation
of Environmental Impacts**

**Overall Evaluation
of the Total Program**

etc.

- JOMGEC is already promoting investment upstream business all over the world, including unconventional resources.
- JOGMEC is also developing new technology to unlock future energy resources and it will lead to further investment.