Japan CCS has embarked upon a full-scale enterprise

RITE CCS Workshop 2008

26th Sep. 2008

Japan CCS Co., Ltd.

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Incorporation of Japan CCS Co., Ltd.

Japan CCS Co., Ltd.

- Incorporated on 26th May 2008
- Invested by 29 major companies in Japan
  - 11 electric power companies
  - 5 petroleum companies
  - 5 engineering companies
  - 3 petroleum resource development companies
  - 2 iron and steel companies
  - 1 chemical company
  - 1 non-iron metal and cement company
  - 1 general trading company

Japan CCS Co., Ltd.

- **President**:

  Shoichi Ishii, Japan Petroleum Exploration Co., Ltd.

- **Directors**:

  Zengo Aizawa, Tokyo Electric Power Company, Inc.

  Yukio Endo, Tohoku Electric Power Company, Inc.

  Mikio Sasada, JFE Steel Corporation

  Akira Hasegawa, Idemitsu Kosan Co., Ltd.

  Tadashi Higashi, Nippon Steel Engineering Co., Ltd.

  Shinichi Mitsuda, Mitsubishi Gas Chemical Company, Inc.

  Kazuo Yamamoto, Teikoku Oil Co., Ltd.

  Masahiro Yoshida, Nippon Oil Corporation

- **Auditor** :

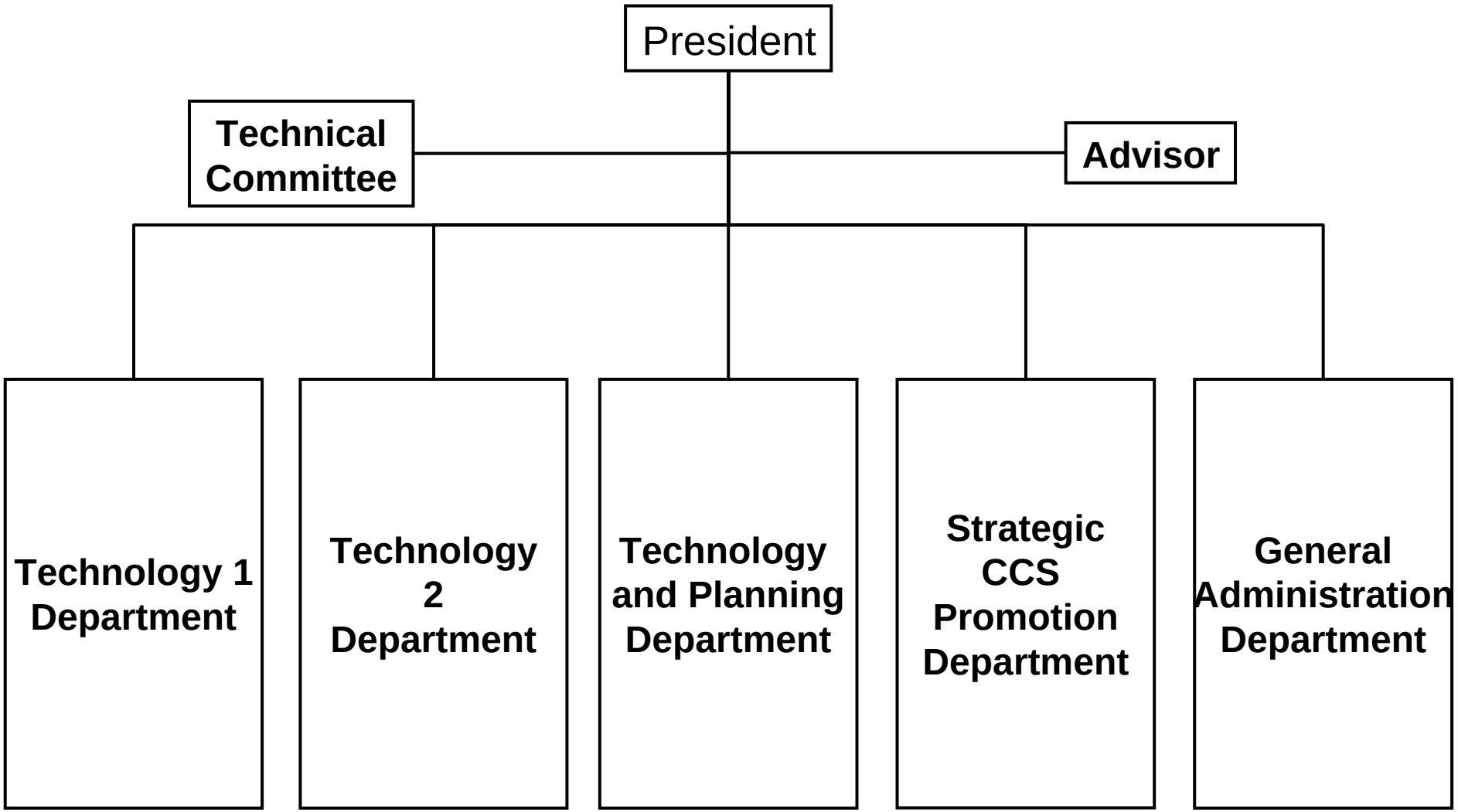
  Takashi Honjo, RITE

Shareholders

Japan CCS Co., Ltd.

- Purpose of the incorporation is to achieve early massive reduction of CO_2 emissions by CCS.
- Our company is the first private company in the world specialized in CCS.
- Individual technologies owned by our shareholders will be integrated and further developed in the company for CCS deployment all over the world.
- Our incorporation means that Japan has taken an important first step from the research to the demonstration stage.

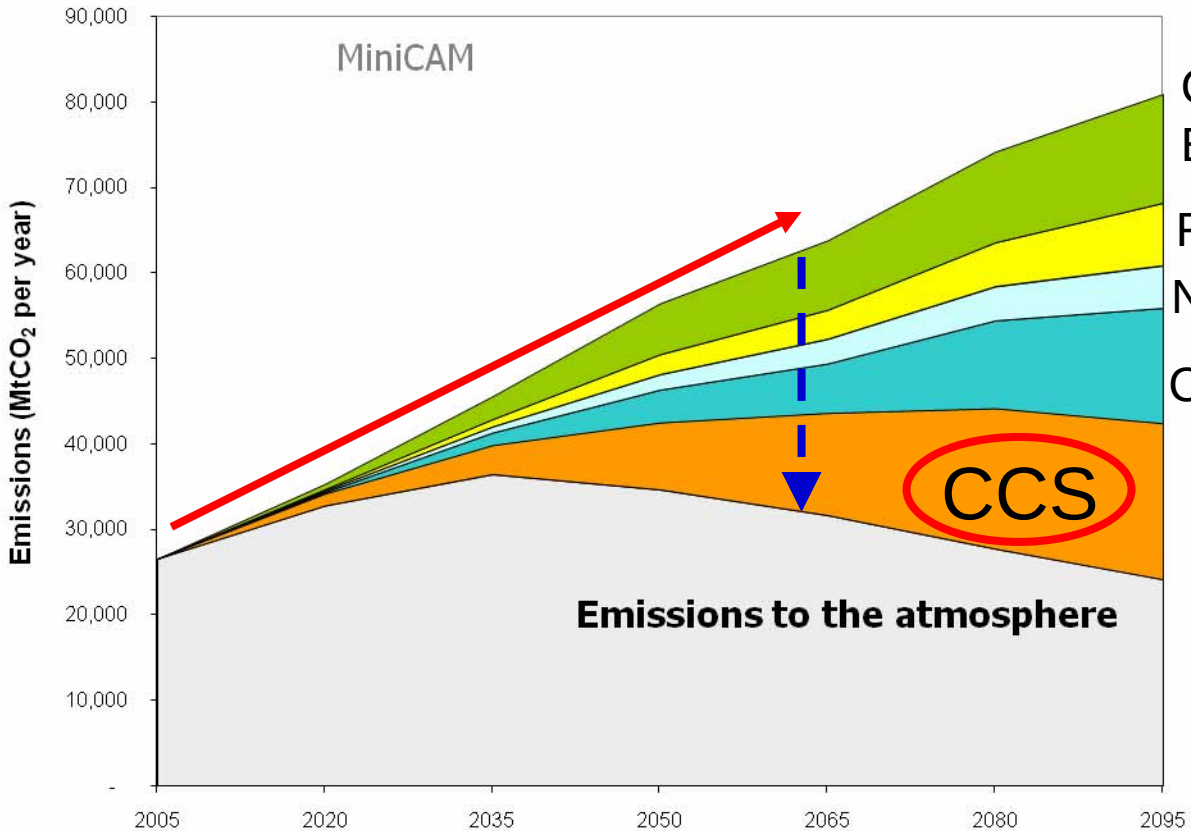
Organization



Total 37 persons

CCS Simple Overview

CCS is a key technology for CO_2 reduction



Conservation and Energy Efficiency

Renewable energy

Nuclear

Coal to Gas substitution

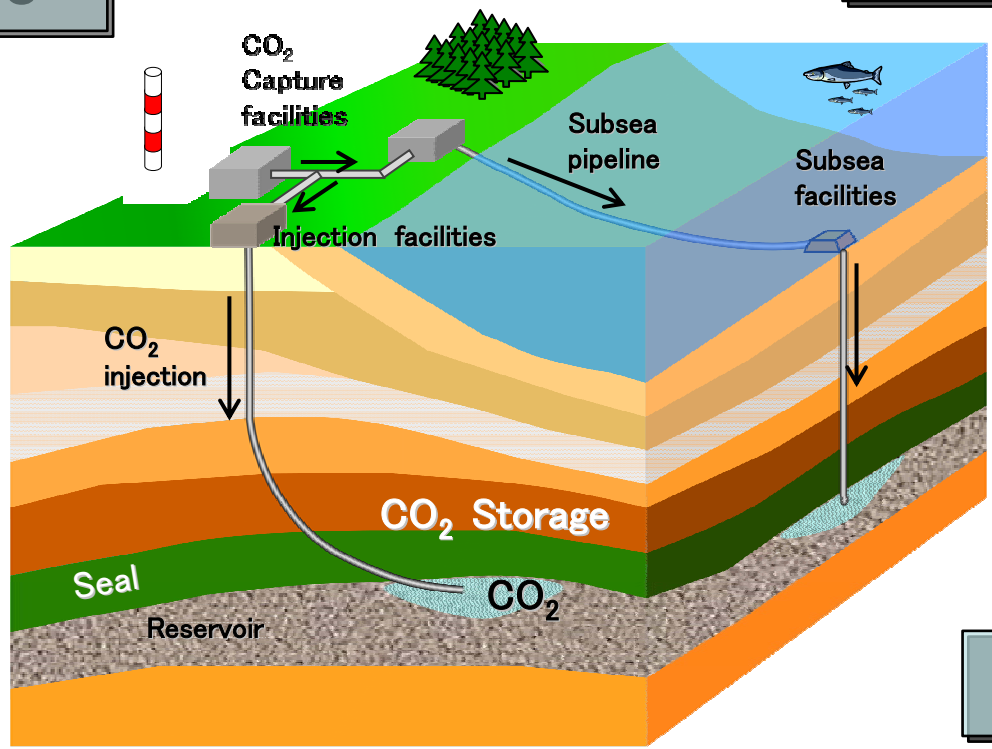
Based on IPCC-SRES B2 scenarios to stabilize CO2 concentration as 550ppm.

After IPCC Special Report on Carbon dioxide Capture and Storage（2005）

What is CCS?

Capture

Transport



Storage

Not to scale

Carbon Dioxide Capture and Storage

Advantages of CCS

- CCS can be launched today with existing technologies.
  - The state-of-the-art technologies in the oil and gas development to carry out reliable CCS operations.
- CCS is capable to reduce large amount of CO_2 at one site.
- A technical potential is at least 2,000 Gt-CO_2 in geological formations world-wide and about 150 Gt-CO_2 in deep saline aquifers in Japan.

Two projects in this year

Two Projects in FY 2008

- “Feasibility Study on a Total System from Electric Power Generation to CO2 Storage”, as a part of the “Innovative Zero Emission Coal Gasification Electric Power Project” funded by NEDO.

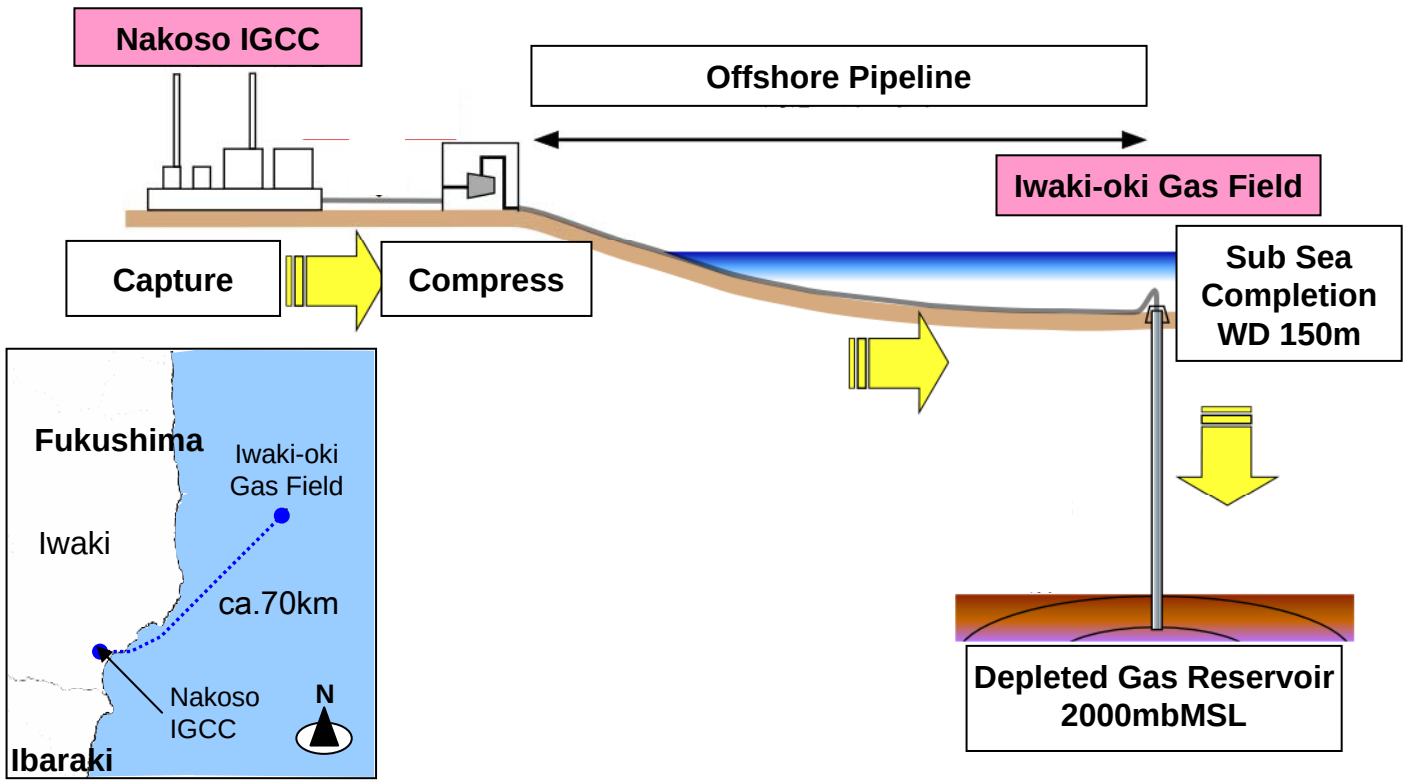
  => “**NEDO Project**”

- “Development of Assessment Technologies for a Deep Aquifer appropriate for Demonstration as a part of Research and Development of Underground Storage Technology for Carbon Dioxide” funded by METI.

  => “**METI Project**”

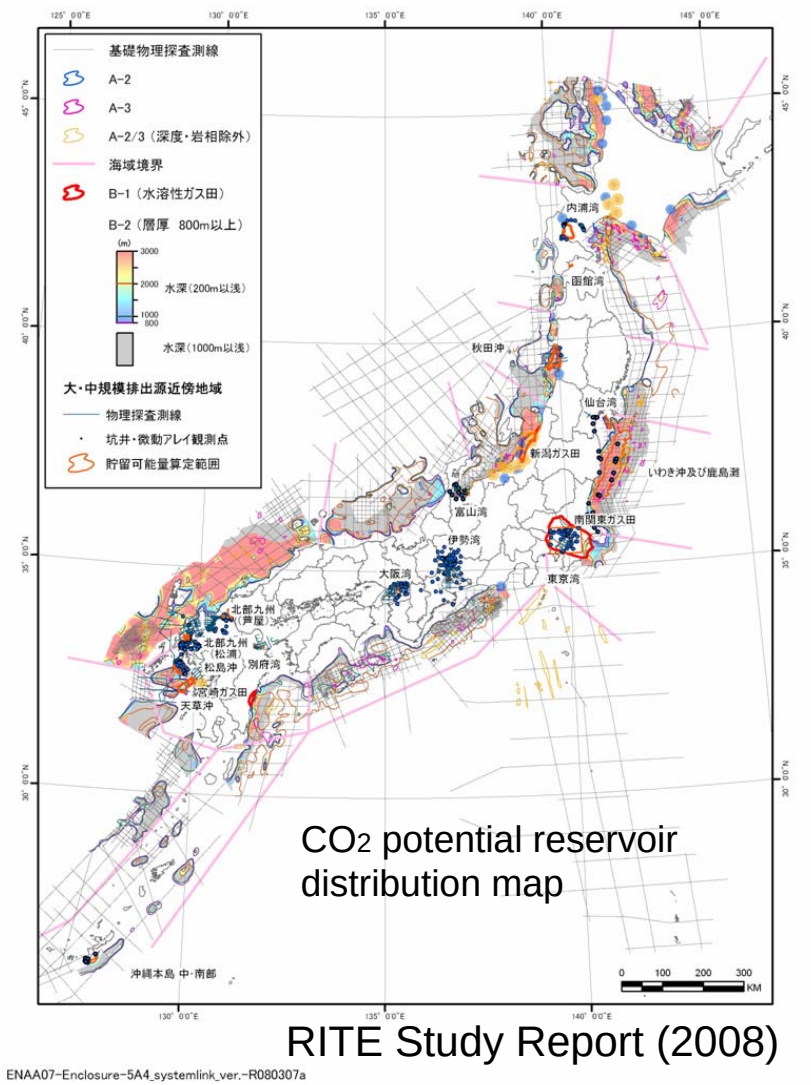
Basic concept of NEDO Project

- Premise: CO2 is captured at the Nakoso IGCC demonstration plant, transported to the Iwaki-oki Gas Field and stored in depleted gas reservoirs in the field.
  - IGCC, Integrated coal Gasification Combined Cycle, demonstration plant is owned and being operated by Clean Coal Power R&D Co., Ltd. (CCP).
- Term: July 2008 – 2010



Outline of METI Project (1/2)

- The purpose of the project is to develop assessing techniques of deep saline aquifers appropriate for CCS demonstrations
  - Geological
  - Engineering



Outline of METI Project (2/2)

For CCS Demonstrations in Japan

- Geological assessment of potential sites
- Engineering study at potential sites
- Faults assessment and marine environmental investigation around potential sites
- Evaluation of economical ripple effects
- Fundamental researches of CO2 behavior in aquifers

Propose assessment techniques for deep aquifers.

Purpose of Demonstrations

- **Tests**

  to solve remaining **technical issues** in monitoring, reservoir simulation and other items

- **Optimizations**

  in **total systems** for industrial scale CCS

- "**Demonstration**"

  to show capabilities of operating CCS Total Systems

  to build a confidence and to be accepted in public

  to bridge for early massive CO2 reduction

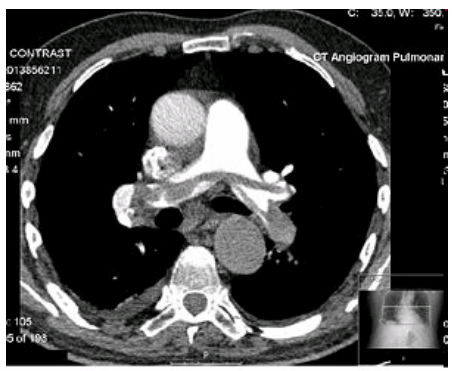
We have a capability of safe CCS

because…

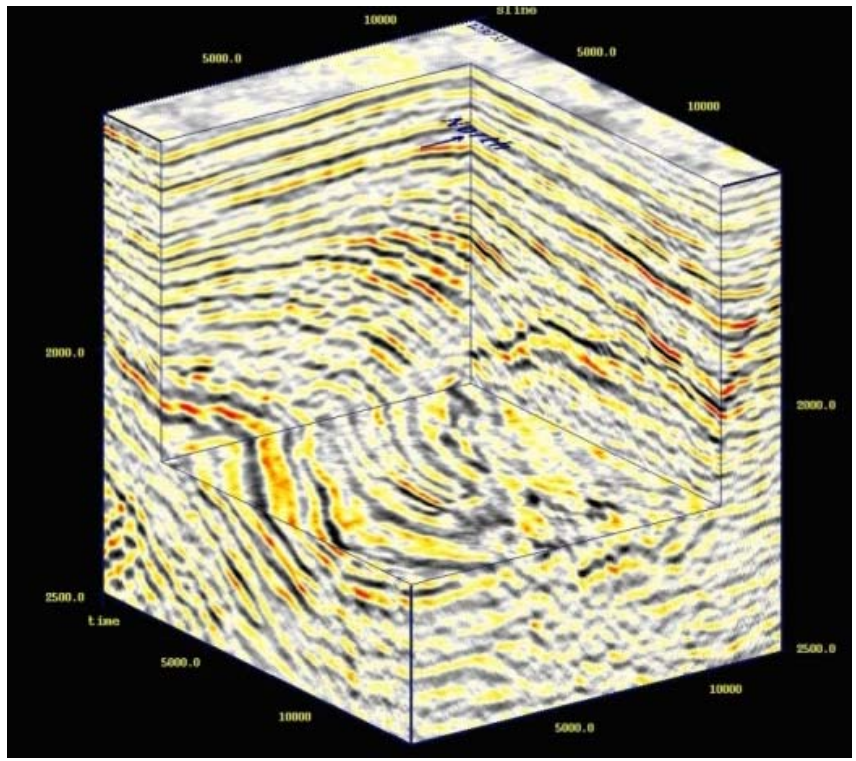
We can see the invisible world below 1,000m subsurface

- Medical
  - Ultrasonography

  - CT



- Subsurface
  - Reflection Seismic



We can operate in the invisible world below 1,000m subsurface

Japan CCS

- Medical
  - laparoscopic surgery
    - ✓ Microscopic surgery
    - ✓ 1-several mm scale target
    - ✓ 100-200 mm away

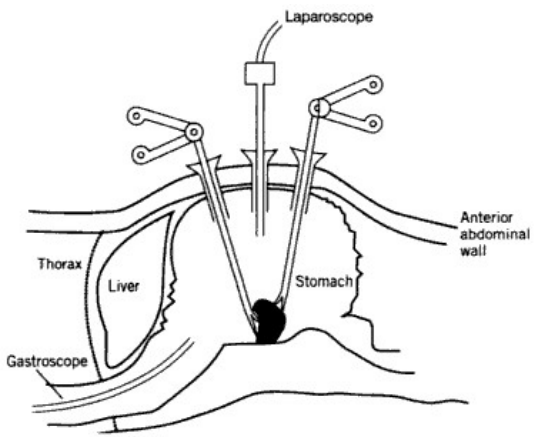
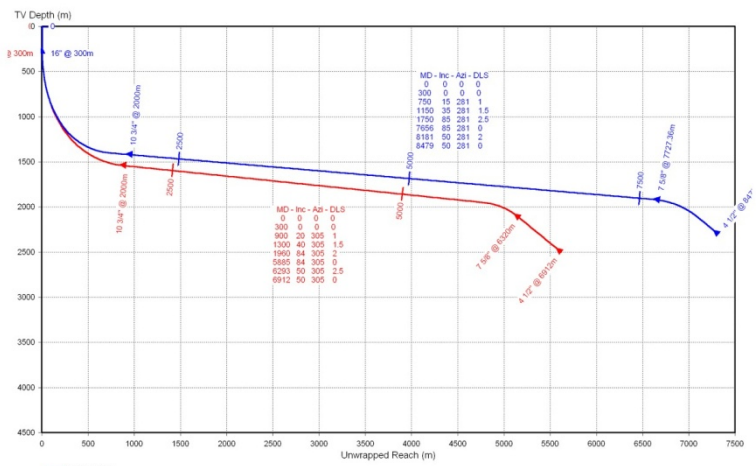


Figure 1.4. A diagram demonstrating intraluminal intragastric access.

Diagram of laparoscopic surgery
After Edmund and Claude, 1996: "Abdominal Access in Open and Laparoscopic Surgery", Wiley-IEEE, ISBN 0471133523

- Subsurface
  - drilling wells
    - ✓ Extended Reach drilling
    - ✓ 10-20 m scale target
    - ✓ 1000-5000 m away



Sample plan of Extended Reach Drilling

Summary

- Japan CCS Company Limited has embarked upon a full-scale CCS enterprise.
- Our incorporation means that the Japan has taken an important first step from the research to the demonstration stage.
- The individual technologies owned by our shareholders will be integrated in our company and further developed for CCS deployment all over the world.
- **We will take the initiative in CCS in the world.**

Thank you for your attention.