エネルギーと環境を考える
JANUS

GLOBAL CCS INSTITUTE
Japan CCS Co., Ltd.

Japan-Asia CCUS Forum

Issues for commercialization of CCS
- Long-term responsibility -

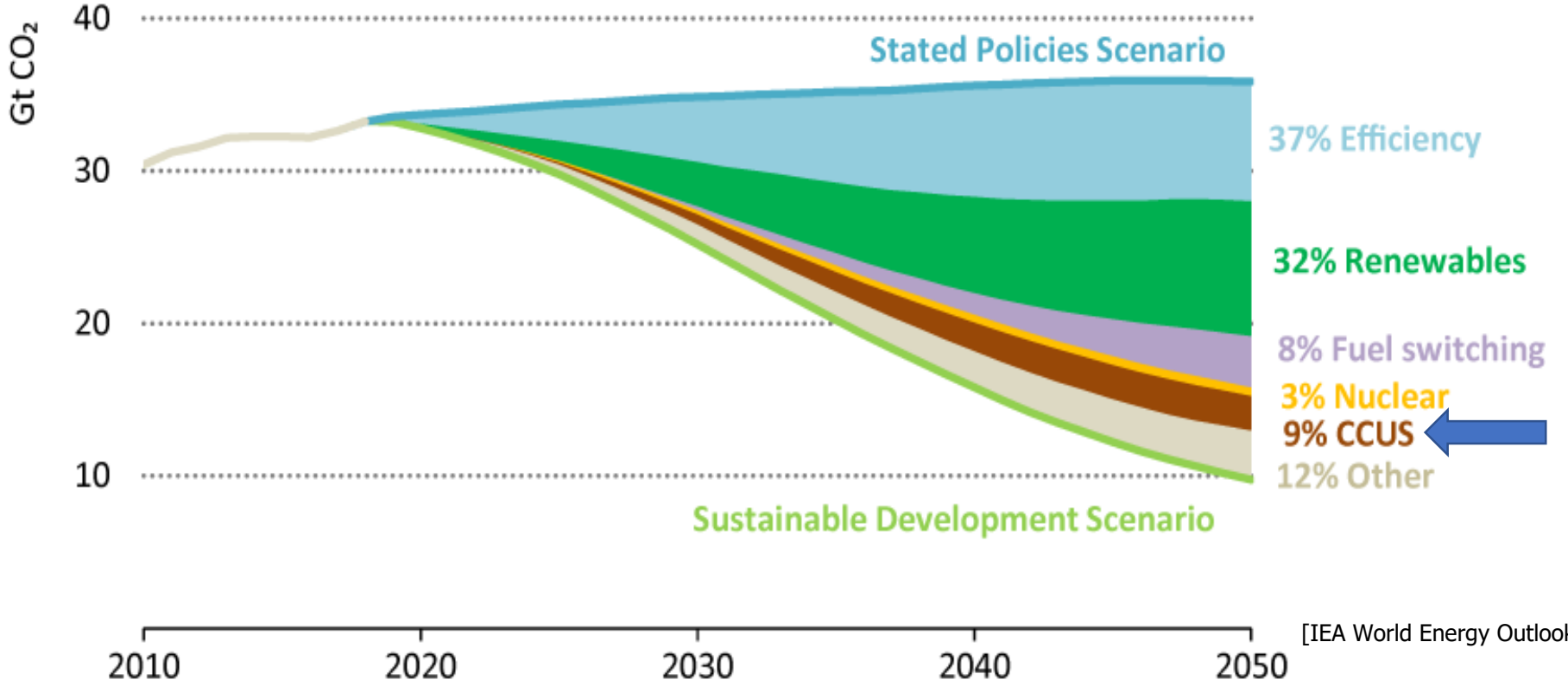
Oct. 6th, 2020

Japan NUS Co., Ltd.

Kishimoto, Yukio

CCS required in the future

IEA World Energy Outlook 2019 ; Actions are needed to bridge the gap between “Stated Policy Scenario” and “Sustainable Development Scenario“.



[IEA World Energy Outlook 2019]

In 2050, CCS is expected to reduce 2.8 billion t-CO_2 globally to achieve the “Sustainable Development Scenario”.

CCS required in the future

In 1.5 ºC-scenario in the IPCC Special Report,

Total CO_2 emission reduction by CCS until 2100 : 348 Gt-CO_2

4.4 billion t-CO_2/year on average from 2020

Required CO_2 emission reduction by CCS in the future

2.8 - 4.4 billion t-CO_2/year

Large Amount !

Japan : 100 million t-CO_2/year ???

Who implements CCS ?

CCS should be implemented
commercially by the private sector
to achieve billions tons of emission reduction.

There are two big issues for private companies to implement CCS;

- Financial incentives (e.g. Carbon Pricing)
- **Reasonable and realistic long-term responsibility**

What is 'Long-term responsibility' ?

Site (reservoir) management after CO_2 injection

to ensure storing CO_2 underground safely and completely

- **By whom? Until when?**
- **Private companies would not implement any CCS project if everlasting responsibility for stored CO_2 is required.**
- **It is rational and realistic to manage the storage site only for a specific period.**

Specific period… How long in other countries?

Long-term responsibility（Liability）

Country / Region	Overviews
USA	**At least 50 years** in principle. However, if there is sufficient evidence that the project no longer poses an endangerment to underground drinking water sources, the site **can be closed even before 50 years** (End of management responsibility)
EU	No shorter than **20 years** in principle Financial obligations ; The operator should provide the country with an amount to cover the monitoring costs for **at least 30 years**
Australia	The long-term responsibility of the operator is **approximately 20 years** (The competent minister will issue a site closure certificate within 5 years after the completion of injection, and, the federal government will monitor for at least 15 years after closure)

Long-term responsibility（Liability）

Two major issues on CCS projects in Japan

1. No law or regulation for onshore CCS in Japan;

It does not mean onshore CCS projects could be implemented without regulation, but onshore CCS projects are impossible due to lack of regulation.

2. Offshore CCS (storage under the seabed) ;

Operators are required to take everlasting responsibility for stored CO_2.

What is a regulatory framework in closure of waste disposal sites in Japan?

Long-term responsibility（Liability）

In the case of final disposal sites (waste landfill) in Japan, operators could close a final disposal site and be exempted from responsibility for managing the site only when it is confirmed that monitoring results meet the technical standards in the law.

This means・・・・

Long-term responsibility（Liability）

No need to keep site management if:

→ no risk on conservation of living environments without any regular maintenance at the site.

→ no adverse effect of leachate and gas from the site on the environment.

Technical standards;

Soils of the reclaimed land is regarded as chemically and physically stable if:

(1)The quality of retained water in the land meets the standards.
(2)The amount of gas from the land is very little.
(3)The underground temperature of the land is not high.

- **This regulation is based on the idea that reclaimed wastes return to natural soil and then the site can be used as a new land.**
- **The governor keeps the records on the location of the waste landfill site.**

Long-term responsibility（Liability）

Some of technical standards for final disposal site closure
(In the case of controlled landfill sites for domestic and industrial wastes)

1) The final disposal site meets the structural standards.
... 2)Offensive odor, 3)Fire, 4)Insect pest
5) The monitoring results of groundwater, etc. meet the water quality standards, and no tendency is shown that they will not meet the standards in the future.
6) By the water quality monitoring of the following items for 2 years or more, it is confirmed that the retained water meets the effluent water standards, etc.
(1) Runoff water quality etc. (at least once every 6 months)
(2) Hydrogen ion concentration(pH), biochemical oxygen demand(BOD), chemical oxygen demand(COD), suspended solid(SS). (at least once every 3 months)
...7)Gas generation, 8)Internal temperature, 9) Closing the opening, 10) Cover
11) There is no obstacle to conserve living environments at the time.

Long-term responsibility（Liability）

Finally,

- ✓ **Private companies cannot take a risk if eternal responsibility for stored CO_2 is imposed after injection.**
  = It is difficult to implement CCS project as a business.
- ✓ **In other advanced countries, the period for managing the storage site is about 20 to 50 years.**
- ✓ **Even final waste disposal sites, which may have a larger impact on the environment than CCS, can be closed by meeting the standards in Japan.**

In order to commercialize domestic CCS projects after 2030, it is necessary to discuss immediately the issue of long-term responsibility for stored CO_2.

thank you for your attention.