PGCA Study Group 1: Carbon Capture and Storage

Susumu Nishio,

Leader, PGCA_SG1

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@Seoul, Korea

Summary of this meeting

1. Sharing information & peer review for the report

- Title
- Topic review & final decision for chapters
- review & modification for each chapter

2. Committee session on WGC2015

- Title
- Description
- Topics of oral presentation

3. Paper selection

- Criteria
- Procedure
- Members

Group Report Progress

Title of the study group report

Proposed for 2 titles

1.CCS development and Perspective for a sustainable gas industry

2. **Overview of CCS development relevant to a sustainable gas Industry**

Group Report Progress

Topic review & final decision for chapters

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1. About this report
2. Why CCS is important for a sustainable gas industry?
3. Status of CCS around the world
4. Technical aspects , Main development in technology
    4-1 capture
    4-2 transportation
    4-3 storage
    4-4 EOR
    4-5 MMV
5. Legal issues
6.Social issues
7.Perspectives in the CO2 utilization
8.Conclusion<Tokyo Gas incl. editing>

Group Report Progress

Chapter 1 :About this report

- Objectives
- Writer
- Brief introduction from the last report
- Focus of this report
  - Status of CCS around the world
  - describe the difference of contents compare to last report in terms of technology
  - emphasize on legal , social issues, as well as CO2 utilization
- Summary of the conclusion

Group Report Progress

Chapter 2 : Why CCS is important for a sustainable gas industry?

- What is the logic using CCS for gas industry?
- Why do you think CCS being important?
- Answers :
  - Gas Demand is going to increase as gas is seen as low carbon fuel today.
  - Looking into the far future, gas will need to compete with alternative energy to be carbon neutral (compare with power generation cost e.g USD/kWh)
  - CCS would provide this option for gas to be carbon neutral, but cost associated with this technology is the one of the major problem.
  - Carbon cost/penalty (legislation/cap & trade systems) may force the gas industry to look into CCS if it becomes a reality

Group Report Progress

Chapter 2 : Why CCS is important for a sustainable gas industry?

	Now	Transition	Future
Coal	✓	x	x
Natural gas	✓	✓✓ (w/o CCS:CO2)	✓✓ (w CCS:CO2≒0)
Renewable	✓ (CO2≒0)	✓✓ (CO2≒0)	✓✓✓ (CO2≒0)

low carbon fuel

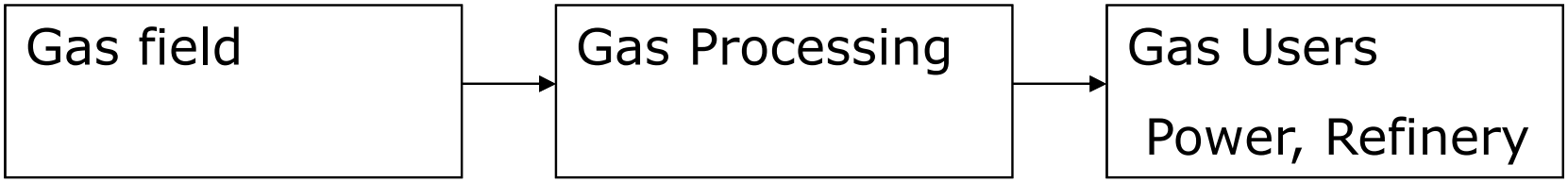
carbon neutral

For solar,wind, geothermal, H_2, nuclear: carbon neutral

Group Report Progress

Chapter 3 : Status of CCS around the world

1. Extracts the CCS projects (operate, execute, define) for the gas industry.
2. Categorize the CCS projects into value chain, site, technologies.



- Onshore/ Offshore
- Saline/ EOR
- How to Capture

Chapter 4: Technology aspects

All topics is preferably aligned with

- introduction
- brief theory
  (referred to previous triennium report)
- technology updates
- experiences
- cost associates

Group Report Progress

Chapter 5 : Legal Issues

Legal frameworks for each country has been investigated in detail.

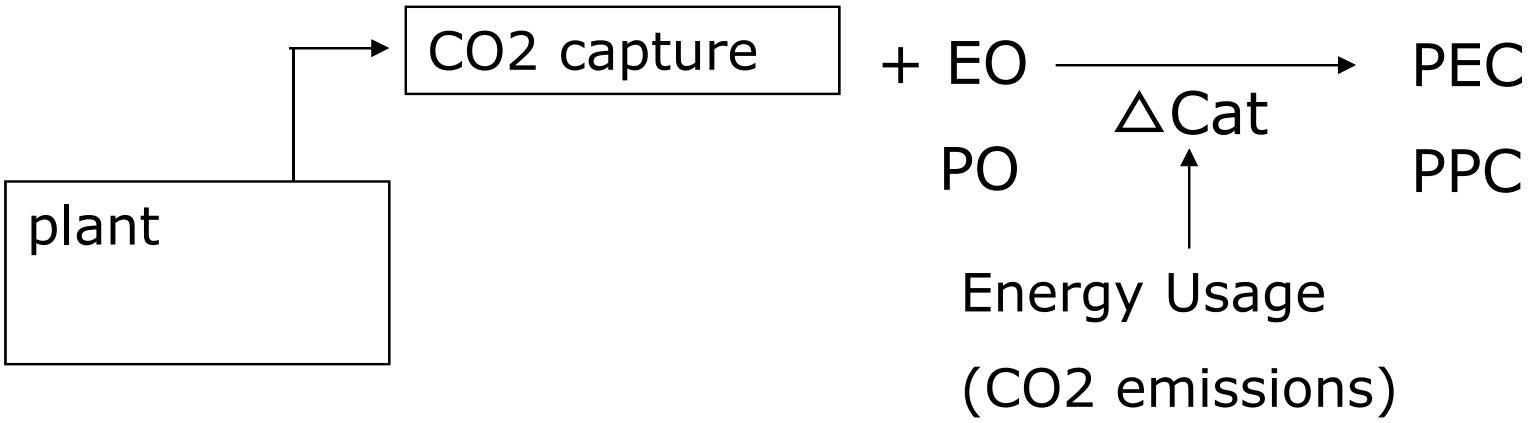
- Extract & highlight a best practice case.

- Describe new issues that are pointed out from the investigations (e.g. MMV)

Group Report Progress

Chapter 7 : Perspectives in the CO2 Utilization

- Flow of chemical compound production



- Balance of CO2 capture & emission will be described

Group Report Progress

Chapter 7 : Perspectives in the CO2 Utilization

- List of practical/ potential CO2 utilization

  Example:

Company	Hot to utilize	Usage amount
AAA Inc.	Chemical process	XX Mt/y
YYY Ltd.	Chemical process	ZZ Mt/y
…	…	…

- Show references for the information

Committee session on WGC2015 (*tentative agenda*)

Invaides, 17:00-18:30, Tue 2nd June, 2015

Room capasity: *350*

- *(10min.) Presentation by group leader*
- *(5min. X 5people) Selected paper presentation*
- *(5min. X 3people) Expert panel*
- *(40min.) Discussion incl. Q&A*

Send an e-mail to candidate people for invitation to submit an abstract.

Committee session on WGC2015

Title:

Overview of CCS development towards a sustainable gas Industry

Objective:

CCS can be an option for the natural progression for a sustainable gas industry.

Papers submitted shall explore the recent development and challenges with regards to CCS technologies, economic feasibility, legal framework and social acceptance.

Recent experiences from CCS implementation in the gas industry could be shared.

New and on-going research and development on capture, transport, storage as well as utilization may also be highlighted.

Committee session on WGC2015

Example of subject matters include:

- **Recent Technology Development in Capture, Transportation, Storage,**
- **Economic feasibility or drivers for implementing CCS in the gas industry**
- **Current status & potential changes in legal and regulatory framework for implementation of CCS**
- **CCS and social acceptance**
- **Potential environmental impacts from accidental large CO2 release (e.g. capture plant, pipelines, storage site)**
- **Perspectives and challenges of CO2 management in the gas industry**
  - **Potential business opportunity in the future**
  - **Collaboration with other sectors (*CO2 compression , piping, storage, utilization*)**
  - **Research and development for CO2 utilization**

Keywords: CCS, CO2 capture, CO2 transportation, CO2 storage, CO2 utilization, MMV, project experiences, social acceptance, legal framework

Paper selection criteria (tentative concept)

Checkpoint for selecting submitted papers

-(First Priority:40%) Address topics below ?

a) Technology

b) Regulatory

c) Socio-potential issues

d) Environmental impact

e) Utilization

-(Second Priority:30%) Relevant for the gas industry?

-(15%) Comprehensive sentence structure

-(10%) Give an example? (e.g. case study, demonstration)

-(5%) Amount of CO2

Agenda for Next Meeting @ Helsinki (*tentative*)

-Peer review of the group report for finalization

-Confirmation of the session agenda on WGC2015

-Confirmation of the criteria for paper selection


CCS can be an option for the natural progression for a sustainable gas industry
Thank you for your attention

Timeschdule:

Mar. 2014 11th Meeting in Korea

Revise & develop each chapters

Peer review for 2nd draft

Sep. 2014 Meeting in Finland

Accomplish the report

Finalize the agenda for committee session

Oct. 2014 Paper Selection Meeting in Japan(?)

Select invited speakers for committee session

Feb. 2015 Meeting in Russia

Jun. 2015 WGC2015

Group report

Chapter & Assignment:

1. *About this report*
   (objective , writer , last report which is role of CCS)
2. *Brief introduction from the last report*
3. *Why CCS is important ? <Tokyo Gas incl. editing work>*
4. ***Status of CCS around the world***
   <Tokyo Gas, sharing with Petronas, Sonatrach>
   incl. onshore/ offshore, related to the gas industry
5. ***Technical aspects , Main development in technology***
   <PDVSA, Sonatrach, NIGC, Petronas, TOTAL> *:*
   capture, transportation , storage , utilization and MMV including best practices and experiences, economical aspects, HSE
6. ***Legal issues<Petronas>***
   -legal and regulatory framework
   incl. Carbon tax/penalty
7. ***Social issues<Petronas>***
   -social (public) acceptance and concern
8. ***Perspectives in the CO2 utilization <PTT, PDVSA>***
9. *Conclusion<Tokyo Gas incl. editing>*

Group report

Chapter & Assignment (detail in Ch. 5):

5. ***Technical aspects , Main development in technology <PDVSA, Sonatrach, NIGC, Petronas, TOTAL>*** *:*

capture	*<**Leader: NIGC** Petronas>*
CO2 transportation	*<**Leader: PDVSA**>*
storage	*<**Leader: TOTAL** Sonatrach PDVSA>*
CO2-EOR	*<**Leader: PDVSA** TOTAL>*
MMV	*<**Leader: Sonatrach** TOTAL>*

including ***best practices and experiences, economical aspects, HSE***

Group Report Progress

Chapter 6 : Social Issues