● In-furnace Nitrous Oxide (N_2O) Reduction Technology

I. Outline of the Project.

Fluidized Bed Combustion (FBC) method has an excellent advantage regarding environment conservation in its low NOx emission, infurnace desulfurization, etc.

However, on other hand, its emission of Nitrous Oxide (N2O: *One of the Global Warming Gases) has been found much more than the amount which other coal combustion facilities emit, although the FBC method has excellent environmental advantages regarding low NOx emission and its infurnace desulfurization, etc. At present, there have been neither established any countermeasure against the Nitrous Oxide emission, nor materialized any gas cleaning technologies for it.

This project has its final target to **decompose and remove the generated Nitrous Oxide from the FBC furnace**. Based on an existing industrial catalyzer, designing and development of a highly advanced catalyzer have been under implementation by reviewing its related reaction mechanism, etc. in order to improve its reactivity, then the above mentioned process would be established.

Those targeted development specifications are shown as follows:

1) Reduction ratio of Nitrous Oxide from the Circulating FBC facility

Over 70 % (when existing catalyzer is used.)

2) Reduction ratio of Nitrous Oxide from the Circulating FBC facility

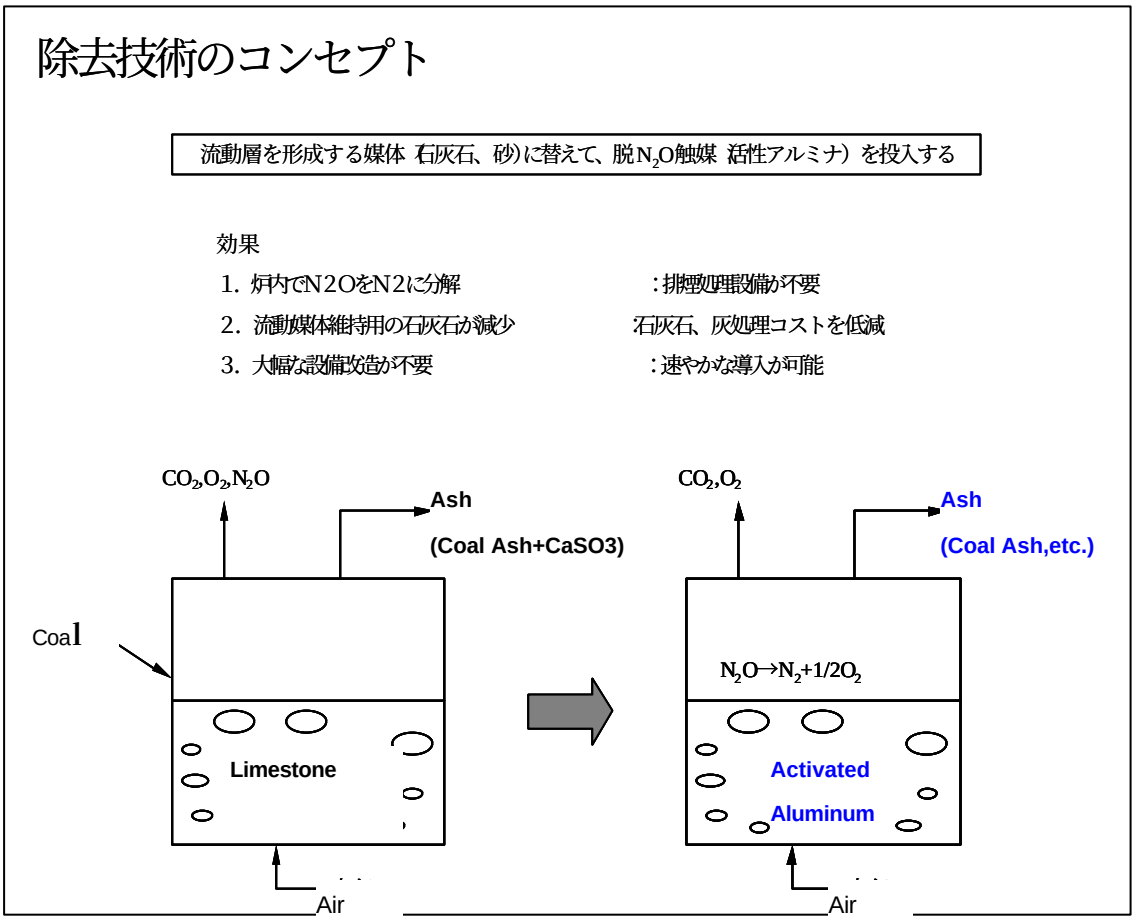
Over 90 % (when reaction ability being improved)

*Nitrous Oxide (N2O) is a substance, which has a strong Global Warming effective potential of several hundred times higher than carbon dioxide (CO2)

Index of Global Warming Effectiveness

in years	20	100	500
CO2	1	1	1
CH_4	56	21	6.5
N_2O	280	310	170

Concept of the Reduction Method



II. Development Process

	FY1999	FY2000	FY2001	FY2002	FY2003
1. Basic Survey					
2. Study using existing catalyzers					
①Basic reaction ability					
②Evaluation using bench plant					
③Applicability as fluidizing media					
④Way to lower cost					
3. Study of new catalyzers to improve reaction ability					
①Design, Test, Evaluation					
②Evaluation using bench plant					
③Applicability as fluidizing media					
④Reaction in process					
4. Feasibility Study					
5. Study using a larger facility					

III. Collaborating Company

Idemitsu Kosan Co., Ltd.