CASA's Position Paper for the third depth review of the National Communication (Japan) to United Nations of Framework of Convention on Climate Change

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Introduction

We'd like to point out three things of the Japanese 3rd National Communication. The first point is that CO_2 emissions in 2010 are forecasted to stabilize relative to 1990 levels even "With additional measures" in "4.2.1 Future outlook for CO_2 from energy sources". The second point is that three gases (HFCs, PFCs, SF_6) emissions in 2010 are forecasted to increase 2% relative to 1995 levels. The third point is that measures in the industrial sector heavily depend on "the Keidanren Voluntary Action Plan on the Environment".

Here, based on our studies, we'd like to talk about CO_2 and three gases (HFCs, PFCs, SF_6) reduction potentials in Japan and point out some problems of "the Keidanren Voluntary Action Plan on the Environment".

1. Possibilities for reducing CO_2 emissions from energy sources

In "4.2.1 Future outlook for CO_2 from energy sources", CO_2 emissions in 2010 are forecasted to stabilize relative to 1990 levels even "With additional measures" which is based on "the Guideline of Measures to Prevent Global Warming" (2002). But this scenario underestimates reduction potentials by technological measures because it doesn't count reductions from making the best of the unfamiliar existing technologies. And it depends on constructing many nuclear power stations as well. However recent nuclear related accidents and electric power companies' misconducts increased the discredit of nuclear among Japanese citizens. This would certainly leads constructing less nuclear power stations than projected and ends up increase of CO_2 emissions.

According to our CASA research (bottom-up end-user model), if you take "Technological Measures" Option, in which 91 CO_2 emission reduction technologies are introduced, CO_2 emissions in 2010 will be increased 0.1% relative to 1990 levels (Table 1). Moreover, CO_2 emissions could be greatly reduced if manufacturing, consumption, transportation, waste disposal, and other physical activity levels are kept as is or reduced (ex. canceling wasteful public works), while solar and wind power generation, etc., are promoted. CO_2 emissions in 2010 could be reduced 9.1% relative to 1990 levels with the "CASA with additional measures" Option (the "30-year nuclear phaseout case").

2. Possibilities for reducing three gases emissions

"4.2.5 Future outlook for HFCs, PFCs, SF6 emissions" forecasts that three gases

(HFCs, PFCs, SF_6) emissions in 2010 could be increased 2% relative to base year (1995) levels.

However much can now be done to cut emissions of the three gases because hardly anything has been done to date. HFCs have many natural substitutes, which if used as replacements will neither accelerate global warming nor deplete the ozone layer (Table 2).

As one example of the anticipated effect of reductions, CASA used released data to calculate the effect of emission reductions in Japan in 2010, assuming that only currently available technologies are used. It would be possible to reduce the total emissions of the three gases about 2% lower than the 1995 level in 2010 (Table 1, Appendix 1).

Japan, the US, and other governments claim that "voluntary initiatives" are sufficient. However, without holding governments to "voluntary initiatives" by agreements or other means, there is no guarantee of target attainment. Also, it is impossible to exclude free riders, and governments cannot even legally require better targets of businesses which do not even develop plans, or which set ridiculously low targets. Even the Japanese government itself predicts that due to measures which are primarily based on voluntary initiatives, 2010 emissions of the three gases will have increased 50% over 1995. It is clear that something else must be done.

3. Problems of "the Keidanren Voluntary Action Plan on the Environment"

"3.4.2 (1) Steady implementation of voluntary action plans and follow-up" says that measures in the industrial sector only depend on "the Keidanren Voluntary Action Plan on the Environment" (voluntary plan) developed by the Japan Federation of Economic Organizations (Keidanren). But "voluntary plan" are non-regal binding measures and we have to say that it has fatal faults and problems such as uncertainty and opaque.

First, "the Guideline of Measures to Prevent Global Warming" forecasts CO_2 emissions in the industrial sector in 2010 will be reduced 7% relative to 1990 level, while "voluntary plan" forecasts stabilization. There is no explanation why there are two different reduction targets. Second, even "0% stabilization" will not be achieved because it premises that many nuclear power stations will be built. Third, unless industrial groups achieve the targets, no sanctions or penalties will impose on them. Enforcement for the industry is very weak compared to the voluntary agreement in EU such as the Energy Efficiency Benchmarking Covenant in Netherlands. Forth, Keidanren implemented a third-party authentication and registration system this autumn. But most of the members consist of representations from industry and researchers closed to industry, so it is impossible to review objectively and fairly.

For promoting measures in the industry, it is essential to set higher reduction targets and strong sanction system against failure.

More information is available at CASA's website.

1. "Developed Countries Should Set Higher Reduction Targets for the Second Commitment Period- An Exploration of the Possibilities for GHG Reductions in Japan-"
   http://www.netplus.ne.jp/~casa/COP8/COP8-GHG-E.pdf

2. "Possibilities for Reducing CFC Substitute Emissions, and Challenges for the UNFCCC"
   http://www.netplus.ne.jp/~casa/COP8/COP8-THREEGASES-E.pdf

Table 1 Effectiveness of Japan's CO_2 Emission Reduction in 2010 According to CASA Scenarios

Gas type		CASA scenarios		Reference: New Guideline
		(1)Technological measures	(2) Combination of measures	
CO_2	Energy conversion sector	+ 7.1%	+ 3.5%	−
	Industrial sector	− 9.2%	−17.3%	− 7.0%
	Transport sector	+16.3%	± 0.0%	+17.0%
	Service sector	+ 5.0%	− 0.1%	− 2.0% (Service, household)
	Household sector	+ 7.0%	− 0.1%	
	CO_2 total	**+ 0.1%**	**− 9.1%**	**± 0.0%**
HFC • PFC • SF_6			− 2.0%	+ 2.0%
Total for CO_2, HFCs, PFCs, and SF_6		**+ 0.1%**	**− 11.1%**	**+ 2.0%**

*Note: Baseline year for CO_2 is 1990; for HFCs, PFCs, and SF_6 it is 1995.

Table 2 Overview of the Three Gases (HFCs, PFCs, SF_6): Uses and Emissions

Main uses	Emission characteristics	Industries using gases (industries needing action)	Main emission sources, times, etc.	Main substitutes
Refrigerants (auto A/Cs, home A/Cs, refrigerators, etc.)	• Often leaks during production and use, releases at disposal time (10-15 years after manufacture/shipping) • Large emissions unless recovered at disposal time • Most emissions 10 or more years after manufacture	• Automakers, auto part makers •Electrical appliance makers •Construction industry	•When discarding auto and home A/Cs, refrigerators, etc. • Huge future emission source	• Hydrocarbon refrigerators are on the market •CO2 refrigerant being developed for auto A/Cs
Insulation	• During several decades after manufacture, gradually replaced by air and expelled • Emissions continue for several decades after manufacture	•Chemicals, construction material manufacturing, construction	• After building material manufacture and installation • Also refrigerator insulation, etc.	• Other blowing agents such as water and hydrocarbons
Sprays	• Used, and emitted, immediately after production • Emitted from fire extinguishing equipment upon use	• Spray industry	• In Japan, most uses involve spraying on HFCs (which are GHG) to remove dust, etc. (not considered "essential uses") • Few medicinal uses, which are touted by the gases' manufacturers	• Various substitutes including hydrocarbons
Manufacture and cleaning of semi conductors and liquid crystals	• PFCs and other substances used to manufacture semiconductors and liquid crystals • PFCs and other substances used to clean electronic parts, etc.	• Semiconductor industry	• Large emission source in Japan • Many Japanese factories are problems because they use gases in open systems, or have no recovery equipment installed	•No replacements currently identified • Big reductions possible by means such as using sealed systems in factories
Insulators	• SF6 sealed into insulators at power substations and factories using high voltage	•Electricity (substations) • Manufacturing (places using high-voltage power)	• None currently identified	•No replacements currently identified • Big reductions possible by means such as using sealed systems in factories

Appendix 1

Scenario for Reducing Emissions of the Three Gases in Japan

- HFCs, PFCs, and SF_6 (the three gases) are powerful GHGs whose GWPs are at maximum over 20,000 times that of CO_2, and account for about 3% (CO_2 equivalent) of Japan's GHG emissions.
- HFCs should be replaced with natural substitutes, while PFCs and SF6, for which substitutes have not been identified, should be strictly controlled within factories. If these two actions are taken, by 2010 it will be possible to reduce emissions of the three gases to one-third those of 1995 (CO_2 equivalent; corresponds to a 2% cut in Japan's total GHG emissions). In other words, although the Guideline of Measures to Prevent Global Warming predicts that 2010 emissions of the three gases will be 2% over those of 1995, it is possible to be 2% lower.
- Current policy basically leaves reductions to voluntary industry plans, and sanctions HFC mass production. Especially if HFCs are used for insulation, emissions will continue for the next several decades. The government should immediately overhaul its policy of expanded HFC use, prohibit all new use of HFCs in insulation, refrigerants, and sprays, and institute strict controls on fugitive emissions of PFCs and SF_6.

>> Basic Approach

- As HFCs have many substitutes, governments should reassess policies allowing increased production and expanded use while depending only on recovery and destruction, and they should switch to policies aimed at reducing HFC production and use, such as by expediting the transition to natural substances that can already be used.
- To deal with PFCs and SF_6, for which substitutes have not been identified, governments should switch to policies that avoid atmospheric releases by using completely closed systems in factories, and subjecting recovered gases to the same strict control as PCBs.
- Taking the above two actions would make substantial reductions possible. Producing, consuming, discarding, and then recovering large quantities of these substances will allow their atmospheric emissions to continue over the next several decades, and fail to solve the problem.

>> Emission Reduction Scenario

- CASA calculated the emission reductions possible in 2010 employing currently available technology, basically using substitutes for HFCs, and strictly controlling PFCs and SF_6 in factories. We found that total emissions of the three gases can be reduced to one-third 1995 emissions (CO_2 equivalent; corresponding to 2% of Japan's total GHG emissions).

Table 1 Outlook for Reducing Emissions of the Three Gases

Units are millions of tons CO_2 equivalent.

	1995	2000	2001	2010			Cuts achieved by CASA's measures (1995)	Remarks
				Guideline BAU	Guideline-based measures	CASA's measures		
3-gas total	48.2	35.6	30.0	107	73	18	−63%	Corresponds to 2% of Japan's total GHG emissions
HFCs	20.0	18.3	15.6					
PFCs	11.5	11.5	9.9					
SF_6	16.7	5.7	4.5					

>> Desirable Measures and Policy Actions

• Outlined below are measures for totally phasing out HFCs, and policy actions for that purpose. It is especially important to prohibit the use of HFCs in insulation, a new use now being encouraged.

Table 2 Necessary Policies and Measures

Field	Main measures	Main policy actions
HFC manufacture	• Cutting fugitive emissions	• Institute standards to curb fugitive emissions
Aerosols (sprays, fire extinguishers)	• Prohibit use	• Control HFC use in open systems (some medical applications alone get temporary measures)
Insulation	• Prevent use	• Control HFC use in open systems (including insulation)
Refrigerants	• Set time limit and ban HFC use in refrigerators • Require HFC recovery	• Limit HFC use in new refrigerators starting in 2008 • Institute standards to control recovery rates and amounts
Semiconductor manufacturing and cleaning (PFCs, SF6)	• Prohibit use in open systems	• Require permission for use in machines (control use of PFCs, etc. in open systems), institute standards to prevent fugitive emissions and regulate recovery
Insulators (SF6)	• Reduce fugitive emissions	• Require permission for use in machines, institute standards to prevent fugitive emissions and regulate recovery • Institute standards to control recovery rates and amounts

• Additionally, in order to expedite substantial reductions in the use of the three gases, and the related substances (for example, the NF_3 used in the semiconductor industry) that are increasing rapidly these days, and to switch to natural substances, it is important to take other actions such as levying taxes proportional to substances' GWPs, and making those substances subject to pollutant release and transfer registers (PRTRs), as well as expanding PRTR systems to show the public which sites are producing, storing, and emitting these substances, and their amounts.

>> Summation

- Producing, consuming, discarding and recovering large quantities of these substances, as at present, will allow their fugitive emissions over the next several decades, and fail to solve the problem.
- If HFCs are used in insulation, the HFCs will be replaced by air and emitted into the atmosphere over the next several decades. It is necessary to replace HFCs with already existing natural substances instead of expanding HFC use into new applications. Instead of relying on recovery alone, the government should immediately institute policies and measures for a total HFC phaseout.
- In the auto air conditioner field, which accounts for much of Japan's refrigerant use, there are reports that manufacturers are developing, or have completed development of, compressors for CO_2 and hydrocarbon refrigerants. The government should institute policy actions that encourage such business efforts. It should also consider Denmark's GWP tax, support for research and development, subsidies, tax incentives, and other inducements.